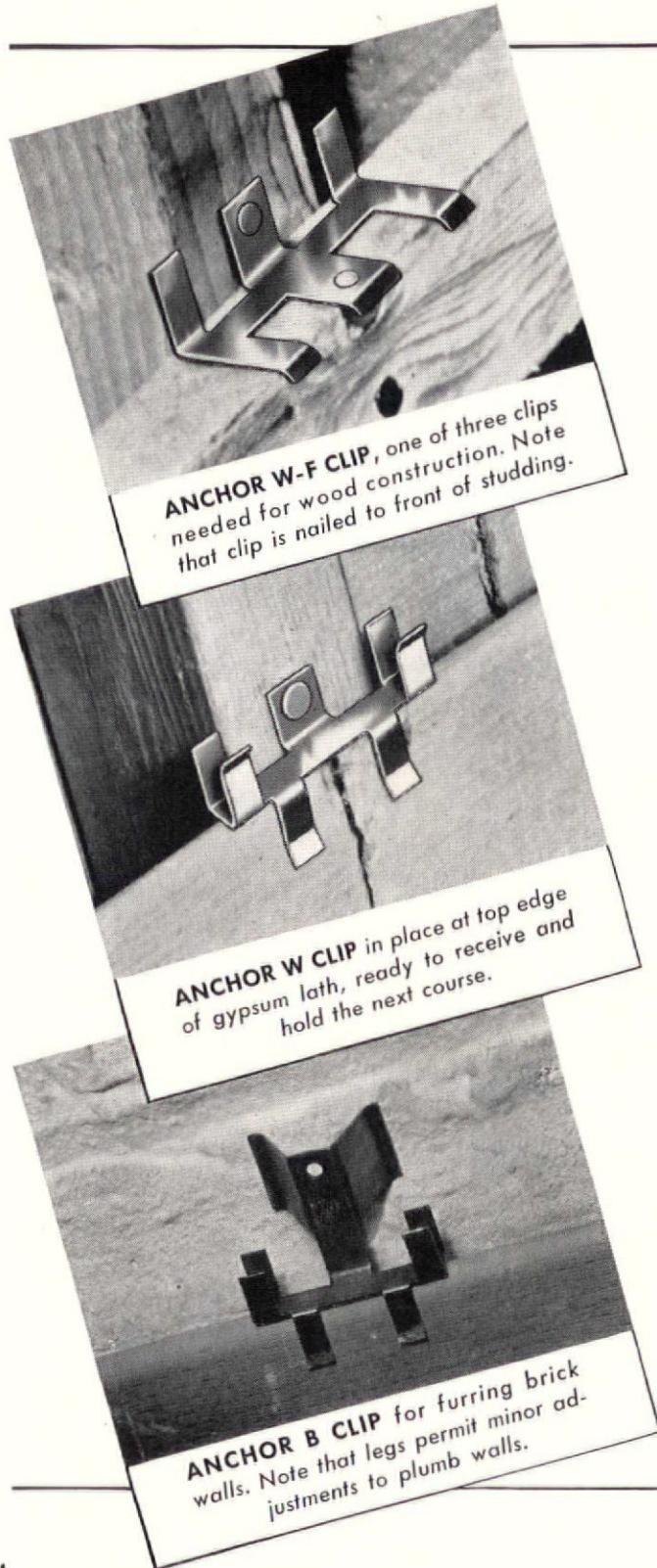


THE ARCHITECTURAL FORUM

JULY 1941

TO REDUCE PLASTER CRACKING IN WOOD CONSTRUCTION . . .
TO REDUCE COSTS IN FIREPROOF CONSTRUCTION . . .

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Complete—Meets All Requirements

Here is a new gypsum lath clip system so versatile that it provides crack-resisting walls for the modest dwelling and *cuts construction costs* in the most luxurious fireproof skyscraper. It is *advantageous* for wood construction, for suspended gypsum lath ceilings, for hollow and solid fireproof walls. And—which is important—the Anchor-Clip System is inexpensive.

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In fireproof construction, the Anchor Clip System is used with standard $\frac{3}{4}$ " channel iron, which is readily available in all localities. No special studs, joists, connectors, rods, or other preformed members are necessary. *This means a marked saving over other methods.* The Anchor Clip System meets FHA requirements for floating wall construction. For complete satisfaction, use the Anchor Clip System with Anchor Gypsum Lath and Celotex Anchor Plaster.

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JULY 1941

BUILDING FOR DEFENSE

Airplane plant in Texas: air conditioned, windowless, bomb-resistant and big, it is built of prefabricated steel panels . . . Trend of defense construction expenditures: a look at a big part of Building's market during the past year and the coming one . . . Federal defense houses' meeting: THE FORUM covers it photographically, reports its accomplishments . . . Completed defense housing projects: a description of seven representative examples from Long Island to Hawaii . . . Headway and Headaches: a blow-by-blow coverage of the month's significant developments on the building-for-defense front.

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Editor, Howard Myers; Managing Editor, Ruth Goodhue; Associates, Paul Grotz, Joseph C. Hazen, Jr., C. Theodore Larson, George Nelson, Henry Wright; Assistants, John Beinert, Anna De Cormis, Richard E. Saunders, Madelaine Thatcher, Nadia Williams. THE ARCHITECTURAL FORUM is published by Time Inc., Henry R. Luce, Chairman; Roy E. Larsen, President; Charles L. Stillman, Vice President and Treasurer; Howard Black, Allen Grover, Eric Hodgins, P. I. Prentice, Vice Presidents; David W. Brumbaugh, Secretary. Publication and Subscription Office, Orange, Conn. Subscriptions may also be sent to 330 East 22nd Street, Chicago, Illinois. Executive, Editorial and Advertising Offices: Time Life Building, Rockefeller Center, New York. Business Manager, H. A. Richter. Advertising Manager, George P. Shutt. Address all editorial correspondence to Time & Life Building, Rockefeller Center, New York. Yearly subscription payable in advance. U. S. and Possessions, Canada, Cuba, Mexico, South America, \$4.00. Elsewhere \$6.00. Single Issues, including Reference Numbers, \$1.00. All copies Mailed Flat. Copyright under International Copyright Convention. All rights reserved under Pan American Copyright Convention. Copyright, 1941, by Time Inc. Printed in U. S. A. VOLUME 75—NUMBER ONE

THE MONTH IN BUILDING

TRENDS. Building continues to boom. April permit statistics (right) show residential activity increasing another 37 per cent over the preceding month. While modernization work jumped a comfortable 14 per cent, non-residential construction zoomed 52 per cent over the March level, stood a full 100 per cent above April 1940. A more up-to-date statistical series, contract awards for May increased 35 per cent over April, marked the largest monthly volume since June 1930. Meanwhile residential rents marked time, construction costs continued upward, jogged 0.7 per cent in April, 8 per cent in the year.

PERMITS

(Source: U. S. Department of Labor)

	Monthly Data			First Four Months	
	Apr. '41 (millions)	Comparison with Mar. '41	Apr. '40	1941 (millions)	Comparison with 1940
Residential	\$157.7	+37%	+ 30%	\$446.7	+24%
Non-residential	97.7	+52	+100	301.9	+89
Additions, repairs	33.9	+14	+ 6	110.6	+ 9
Total	289.3	+40	+ 45	859.2	+39

TRUST-BUSTING CON'T.

Entering Building's big league, Trustbuster Thurman Arnold, last month announced indictments by a Colorado Grand Jury against 244 defendants including the National Retail Lumber Dealers Association. Alleging a conspiracy to restrain trade in the distribution of building materials, the indictments cite a program designed to allocate exclusive dealer territories, to monopolize distribution and to fix retail prices in Colorado, Wyoming and New Mexico. The indictments charge that the defendants published identical price lists, arbitrary rosters of recognized dealers and refused to sell to "independents."

Whether or not active, pugnacious Mr. Arnold will win against such powerful defendants remains for time to tell. However, he and his team-mates in the Justice Department's Anti-trust Division are no rookies. Latest minor league victory on a price fixing charge was over three St. Louis millwork companies. Score: Department of Justice—\$25,450 received in fines; defendants—chastened reputations.

Since the Anti-trust division has moved into the building industry, it has had few setbacks. And, indications are that more and bigger scalps will soon hang from the division's already-laden belt, for recently Arnold convincingly justified his work before the House Appropriations Committee, had the Division's operating budget boosted to \$2.4 million—up \$1 million from last year. Arnold's succinct arguments: 1) Testimony from impartial experts who estimate that the Anti-trust Division last year saved consumers approximately \$300 million in building costs. 2) The Division more than pays its way by the fines and penalties that it brings into the Treasury, without counting immense indirect benefits derived from a healthy price structure.

Carefully developed in his book, "Bottlenecks of Business," is Arnold's theory that *any* group which does not operate for the consumers' best interests should be broken. Builders have long wondered when, if ever, he would put theory to practice on building trades unions. With a

boosted budget, Arnold has indicated that constricting and irregular building unions are in for a thorough going-over. Now that the whole country has put its shoulder to the wheel of national defense, conspiracy and restraint are no longer indulgent luxuries. If, in their future activities, the trust-busters show no discrimination in rough treating manufacturers, retailers and building unions, observers agree that all sides of the building industry will be more willing to take their separate spankings.

BUILDERS POW-WOW

Meeting in Washington last month, Home Builders Institute of America, articulate branch of the National Association of Real Estate Boards, again itemized a syllabus for building during and after the "emergency." HBI pointed most of its guns at U. S. Government, advocated: 1) The establishment of a new Federal research bureau to set standards on materials and methods for substantial yet economical building. 2) Continuance by FHA to insure mortgages on existing houses and legislated extension of Title I loan insurance for new small house construction. 3) Permission by Government for private home builders to undertake any defense housing they are qualified to build. 4) Adjustment of FHA appraisals to reflect the recent rise in construction costs, which HBI estimates at 15 per cent.

Notable comments by equally notable HBI convention guests:

► Philip W. Kniskern, NAREB president, on defense housing locations: "Why not use some of the big surplus of vacant residential lots which we already have, instead of adding to the tremendous over-supply of existing building sites?"

► J. C. Nichols, Kansas City's biggest subdivider, now of OPM: "At least 200,000 defense houses are needed now, perhaps another 200,000 next year."

► FW Administrator John M. Carmody: "More has been done in the last ten years . . . toward putting the building industry into a position to do for the post-emergency ahead of us what the automobile industry did for useful employment of the national

productive power. But we must find ways of developing a house to cost \$3,000 or less." (Let Searcher Carmody look at pages 66 and 67.—ED.)

► Roy Wenzlick, famed real estate analyst: "The present cost of building a house is lower, expressed in dollars, than we expect it to be in the next twenty years."

SUBDIVIDER SCHOOL

Concurrent with its Washington conference (see above) came HBI's announcement of a two-weeks course in Home Building Methods to be taught at Pennsylvania University during August. Significantly the first course of its kind, the instruction will cover all phases of operative home building, including such practical topics as cost budgeting, cost accounting, FHA requirements, marketing methods and market analysis.

Former NAREB President Paul Stark of Madison, Wis. will head the faculty, be assisted by some of the nation's ablest architects and Government experts. Three FHA division chiefs, Curt Mack, Seward H. Mott and Howard P. Vermilya, will represent the Government end of housing. Architects on the faculty will include Randolph Evans of New York City and Kenneth W. Dalzell of East Orange, New Jersey. John McC. Mowbray, Baltimore developer, and Robert L. Davison, housing research director of the John B. Pierce Foundation, will also teach.

Open to all established house builders who have the \$70 tuition fee, the course will involve informal query sessions, some field trips. It promises to add much in sound operative building principles to the students' practical experience.

LUMBER SURVEY

When President Roosevelt called 2.8 million marching feet of our best men, he also called 1 billion board feet of our best lumber. With cantonments and defense workers' housing, Atlantic island air bases, shipyard pilings, small fighting boats and all the other needs of an impregnable defense, the U. S. Government has become the largest customer for U. S. lumber.

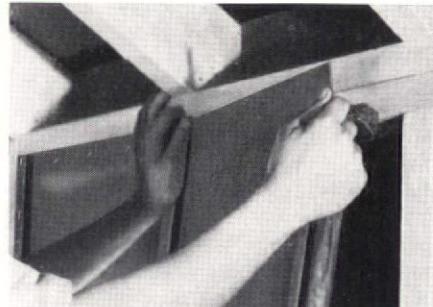
HERE'S HOW TO APPLY
MASONITE* CELL-U-BLANKET*
THE NEW VAPOR BARRIER INSULATION IN BLANKET FORM



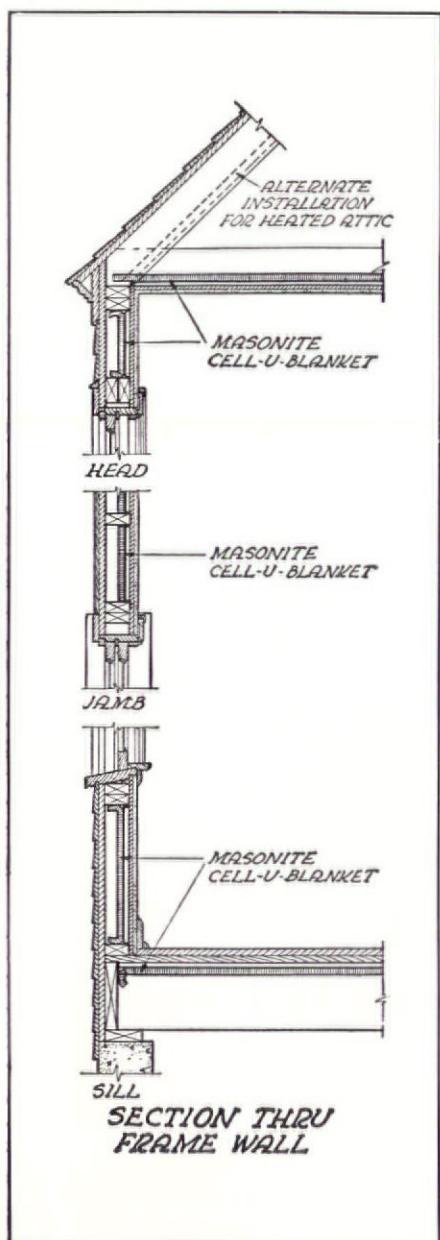
1. A cross-section of Masonite Cell-U-Blanket showing the Cellufoam core and the vapor barrier casing complete with stapling flange.



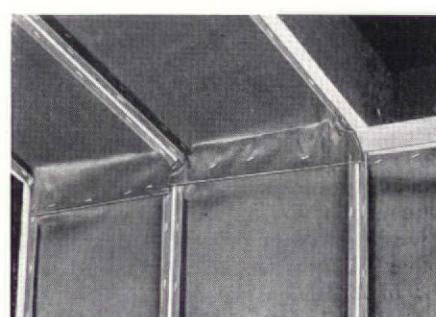
2. Cut Masonite Cell-U-Blanket 3 1/4 inches longer than the dimension between top and bottom plates, using sturdy scissors or snips.



3. Then cut casing approximately 2 inches on both sides, fold back the Cellufoam core. Apply by stapling vapor barrier flange to face of plate.



4. For side-wall insulation, staple flange of Masonite Cell-U-Blanket to face of studs, using $\frac{3}{4}$ -inch-long staples spaced not more than 6 inches o.c.



5. Allow vapor barrier flaps of Cell-U-Blanket to overlap at plates or headers. Staple flanges securely to insure continuous vapor barrier.

Masonite Cell-U-Blanket is a flexible blanket-type insulation with a core of Cellufoam, today's most sensational insulating material. It is designed primarily for application to studs, joists and rafters, as shown above.

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proofed. Authoritative tests show that the heat transmission or "U" factor of *De Luxe Silver Sheen* Cell-U-Blanket is 0.157 B.T.U.s per hr. per sq. ft. per degree F. of temp. diff.

TWO TYPES—There's *Standard* Masonite Cell-U-Blanket, with sturdy asphalt impregnated coverings on both sides.

And there's *Silver Sheen* Masonite Cell-U-Blanket, with a non-metallic reflective surface on the flange side.

THREE THICKNESSES—*Utility*—approx. $\frac{1}{2}$ ". *Efficiency*—approx. $\frac{3}{4}$ ". *De Luxe*—approx. 1".

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VOLUME 75
Number 1

THE MONTH IN BUILDING

Whether or not this customer's demands would produce a lumber shortage was until last month a moot question. However, a report, issued a few weeks ago by the Commerce Department's Lumber Survey Committee has thrown some light on the problem. It predicts nothing but indicates much.

Everything is up—consumption, production and yard stocks. For the first time in history lumber imports for the first quarter year exceeded exports.

Private lumber consumption has increased apace the defense tempo. The railroad industry has increased its tie renewals, has almost doubled last year's boxcar purchases with an order for 24,000. Sales of furniture, to fill the new defense homes, are 30 to 40 per cent above a year ago. With wooden boxes needed for powder and shells, activity in this industry has increased 15 per cent, and indication is that this activity is as yet comparatively small. Private residential construction has enjoyed a 30 per cent rise.

Comparatively, for the first 17 weeks of 1941, lumber production was 16 per cent more than 1940, presaging a total output in 1941 of 30 billion board feet. Reports from retail lumberyards show yard stocks reserves totaling 7 billion board feet, up 4 per cent from last year. At present, consumption and production have almost balanced and lumber prices have receded from their highpoint of last December, have caused Price Boss Leon Henderson few headaches since year-end.

If, however, the President's emergency proclamation means what some observers predict, the balance between lumber production and consumption will be gravely endangered. Thus, it may mean an additional 600 billion board feet for construction of the Army's now tentative 27 additional major camps, other millions of feet for adrenalized private defense construction, a cessation of imports, higher prices—possibly a lumber shortage and headache for Mr. Henderson.

DEFENSE ARCHITECT

"In Civilian Defense the architect has a big job cut out for him," states Harry M. Prince. As an architect, public building expert, right bower to recently appointed Civilian Defense Head Fiorello H. LaGuardia (see p. 12), and as probably the most informed man on civilian defense in America today, Mr. Prince should know.

Since October 1939 Prince and a specially trained staff of 40 have been quietly studying the effects of Europe's war on its cities, have been devising civilian defense strategy for New York City. Their results, secret until recently publicized by the *New York Sun*, consist of text books, pamphlets and posters concerning individual protec-

tion, personnel organization, maintenance of public utilities, design and construction of bomb shelters.

Vital to the work have been the reports from foreign countries on effective defense practices. Almost every European country except, of course, Germany and Italy, have made important up-to-date contributions. Other data Prince obtained through reports of fire and police observers sent to England.

The conglomerate material, now three years in compilation, reveals many constructive facts valuable to architects and builders. Chief among them:

► Permanent shelters are the best safeguards of civilian lives under bombing and for reasons of economy they should be dual in purpose, serve peaceful purposes as well. Improvised shelters, such as sub-



Defense Architect Harry Prince

ways, cause grave health and sanitation problems. In London it has necessitated expensive extensions of utilities.

► In metropolitan areas, garages and warehouses should be designed and constructed to withstand bombing so they can be converted into effective shelters when war comes.

► In tenement areas, permanent structures should be built by the community and located strategically, for the two-fold purpose of acting as shelter during war, community health centers during peace. London's improvised shelters in these areas have proved inadequate since 15 per cent of London's population is caught in the streets by enemy bombers.

► Exodus from cities during an emergency is not great enough to affect rent conditions unduly. Experience of London shows that during an emergency, members of the average family prefer to stick it out together in one place—their own home.

► Office building owners and operators should instruct their tenants to stay in the

building. There is an interval of only 12 to 15 minutes between the sighting of the bomber and the bomb explosion. Evacuation would only cause more panic and confusion, more loss of life.

► With some adaptation, fireproof metropolitan skyscrapers are the safest places during an air raid. A direct hit will penetrate only four or five floors. If the outside walls of corridors are barricaded against fragments of granite and glass, the inside corridors become as safe as the third sub-basement.

► Organization of civilian defense activity should stem from the military corps area command, should be as simple as possible. The plan which Mr. Prince views with most favor has as its civilian head the Mayor, assisted by staff functionaries, executive director and public relations director. Line divisions directed by the Mayor through a small Emergency Board consist of Police, Fire, Utilities, Welfare, Health and Hospital and Auxiliaries. Each department will have its special functions and will be serviced by the Auxiliaries Division consisting of all volunteer organizations (Red Cross, American Legion, etc.). City areas of jurisdiction may be divided by police, school or fire precincts. Mr. Prince prefers the latter.

In public life since 1934 when he was appointed First Deputy Commissioner of Tenement Houses in New York City, Harry M. Prince came well adapted to his job. Except for two years overseas in the Army's photographic service, his previous 25 years professional experience had been in private architecture, specializing in hotel design (Carlyle Hotel—New York City). With the inception of the New York City Housing Authority in 1938, Prince became Deputy Commissioner of its Housing Division, did yeoman's work on the development of New York City's housing projects until the Mayor drafted him for defense.

Slight, esthetic, yet dynamic and articulate, Prince has done a quiet, almost secret task; he might never have come into public limelight. However, with Mayor LaGuardia's appointment to the national post of Director of Civilian Defense, the work of Architect Harry Prince may shape the civilian defense pattern of the nation. Then, if war comes, to quote the *New York Sun*, "men, women and children will know him as . . . the man whose foresight and advance work saved thousands of lives."

REALTY BY RADIO

Can radio sell real estate? This question has piqued the curiosity of ambitious radio advertising salesmen and realtors since the invention of crystal sets. Recently in Washington, D. C. both parties received a convincing answer in two success stories on radio home sales which last year amounted to \$250,000.

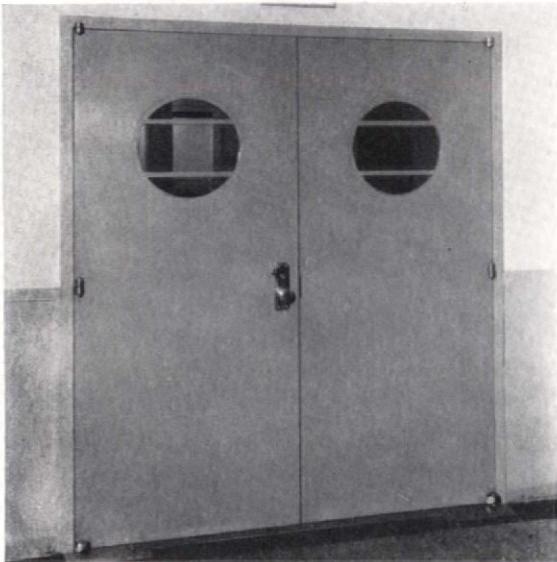
Last October, Washington's Newbold Development Co. in an effort to merchan-

(Continued on page 34)

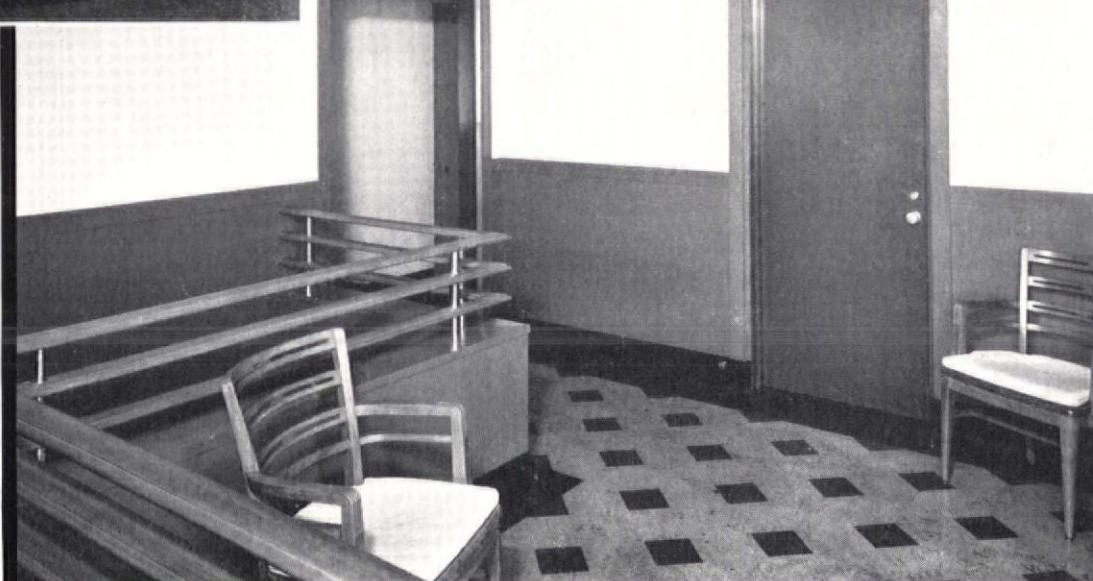
"MODERN DOORS AND WAINSCOT

THAT

Stand the Gaff!!

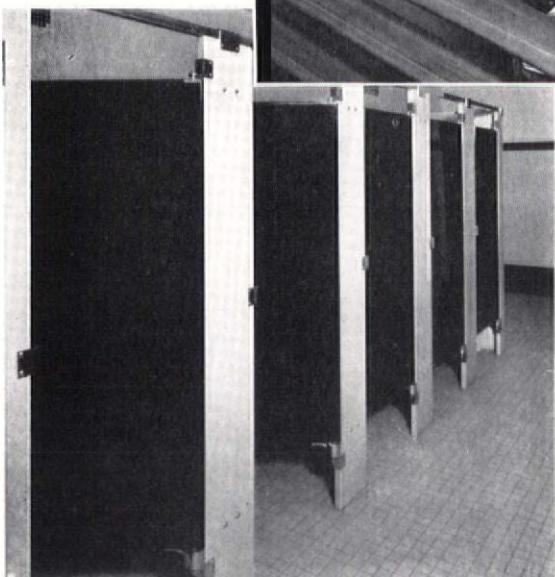


• Formica flush doors with circular cut outs, cafeteria, Social Security Building, Washington, D. C.



• Formica wainscot and doors installed in administration building of the Susquehanna Bridge, Havre de Grace, Md., by John C. Knipp & Sons.

• Formica black lavatory doors in the Social Security Building at Washington, D. C.



In public buildings where durability as well as attractiveness is a first consideration, light, smoothly finished Formica doors have been growing rapidly in popularity. The plastic surface is very easy to keep clean, and never spots, chips or fades. It requires no laborious polishing but can be washed with soap and water or with alcohol or other ordinary solvents.

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Material is veneered on hardwood lumber cores which hold hardware. Cut outs of any ordinary shape are possible.

Formica wainscot is flexible and will not crack if walls shift. Stands wear and cleaning indefinitely, always looks the same. Architects details and color charts on request.

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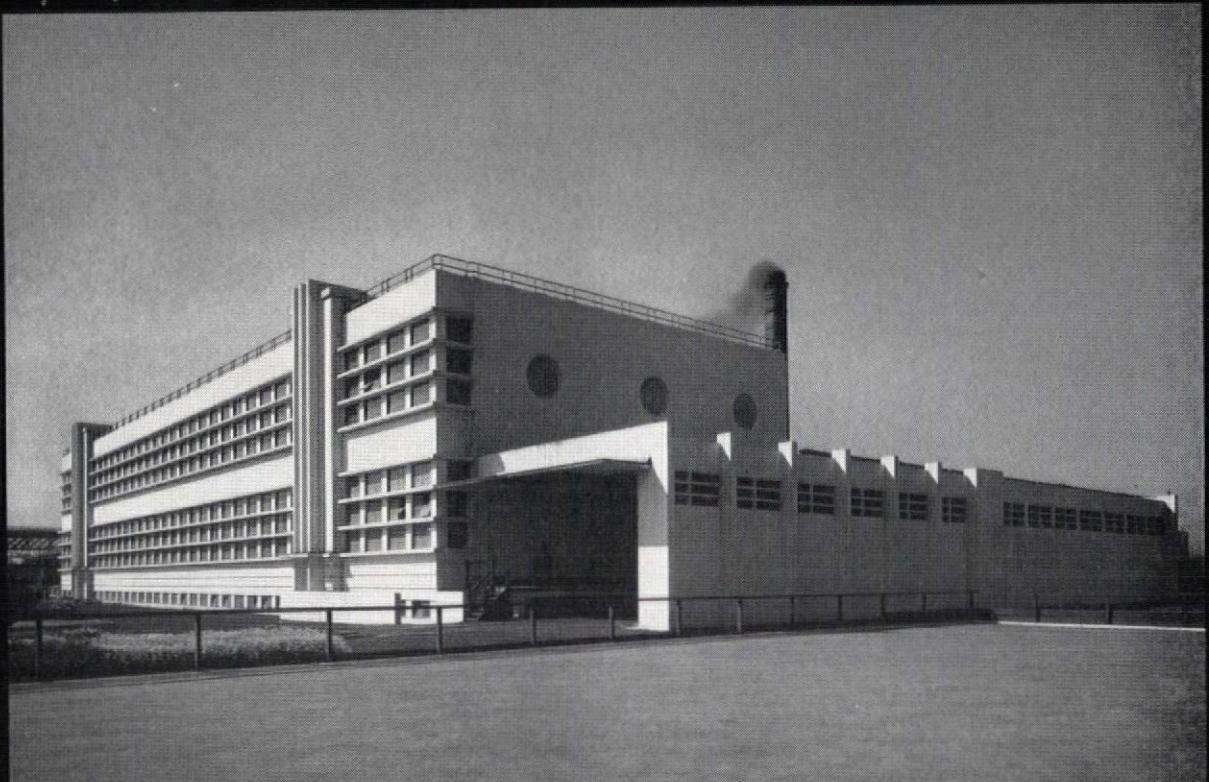
Without reliable plumbing, the most modern bathroom, kitchen and laundry fixtures cannot continue to give efficient service through the years. Heating units cannot maintain their maximum efficiency with a system that gradually restricts flow, clogs, rusts and leaks.

A NEW BROOM SWEEPS CLEAN—AT FIRST—AND RUSTABLE PIPING MAY AFFORD EFFICIENT SERVICE FOR THE FIRST FEW YEARS—THEN EXPENSE AND TROUBLE COMMENCE. INSTALL A STREAMLINE COPPER SYSTEM THAT WILL BE JUST AS GOOD TOMORROW AND ALL THE SUCCEEDING TOMORROWS AS LONG AS THE BUILDING STANDS.

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Send for HOPE'S Publication No. 76 (June, 1941) which gives complete detailed description.

HOPE'S WINDOWS INC., Jamestown, N.Y.



Assembling the Stran-Steel frame of an apartment building. Studs and floor joists are spaced 24 inches on center. Self-threading screws are used to hold the studs securely to the top and bottom plates. Note Stran-Steel method of lock-bridging between floor joists in background.

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STRAN STEEL



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GET THE FACTS

The new Stran-Steel manual, "STRAN-STEEL ON THE JOB," contains detailed descriptions and photographs of Stran-Steel in use. It will be sent to you FREE on request.



The Nailing Groove—an exclusive Stran-Steel feature—is one of the secrets of the fast erection of buildings framed with Stran-Steel. In the photo above, wallboard is nailed to the Stran-Steel studs. In the lower photo, corrugated sheet for a subfloor is being nailed to the Stran-Steel joists.



FORUM OF EVENTS



Darwin Tiemann

A.I.A. CONVENTION HIGHLIGHTS

Held in a time of unprecedented stress, with the immediate outlook for its members none too certain, the American Institute of Architects' Seventy-third convention was nevertheless one of the gayest, fastest-moving and most scenically elaborate in Institute history. From Yosemite, where most of the meetings were held, the Convention migrated to Los Angeles for its final dinner. Sightseeing wound up with a two-day junket through Santa Barbara to San Francisco. Convention meetings discussed Defense, Civilian Defense, and Post-War Building, passed a resolution endorsing the creation of a National Housing Institute, applauded and adopted a resolution calling for educational clinics as part of the architect's post-college education, decided to make a thorough study of affiliation with State Associations. Richmond H. Shreve was elected President, and Walter McCornack, Charles T. Ingham and John Fugard were continued in their offices of Vice-President, Secretary and Treasurer.

Dan Otto Photos

Delegates, members and guests respond to the invigorating Yosemite climate and a swing band. Right, a dinner dance at the Ahwahnee Hotel.

President Richmond H. Shreve (center) distinguished South American guests turn their backs to Half Dome. Left and right, Zorilla de San Martin, painter, sculptor and museum director, and Armando Acosta y Lara, architect and Chairman of the national Board of Education, both of Uruguay.



At a cocktail party in the studio of famed photographer Ansel Adams, Architects Ernest Born (left) and Timothy Pflueger of San Francisco are impressed by Editor Kenneth Reid of "Pencil Points."

A Junior G Man badge to anyone identifying the gentleman between David Witmer and H. Roy Kelley.



Bathed in California sunshine, Architects Samuel and Victorine Homsey of Wilmington, Delaware.

Berkeley's Howard Moise (below) welcomes Talmadge C. Hughes of Detroit via Eugene Weston of Los Angeles.



THE ARCHITECTURAL FORUM

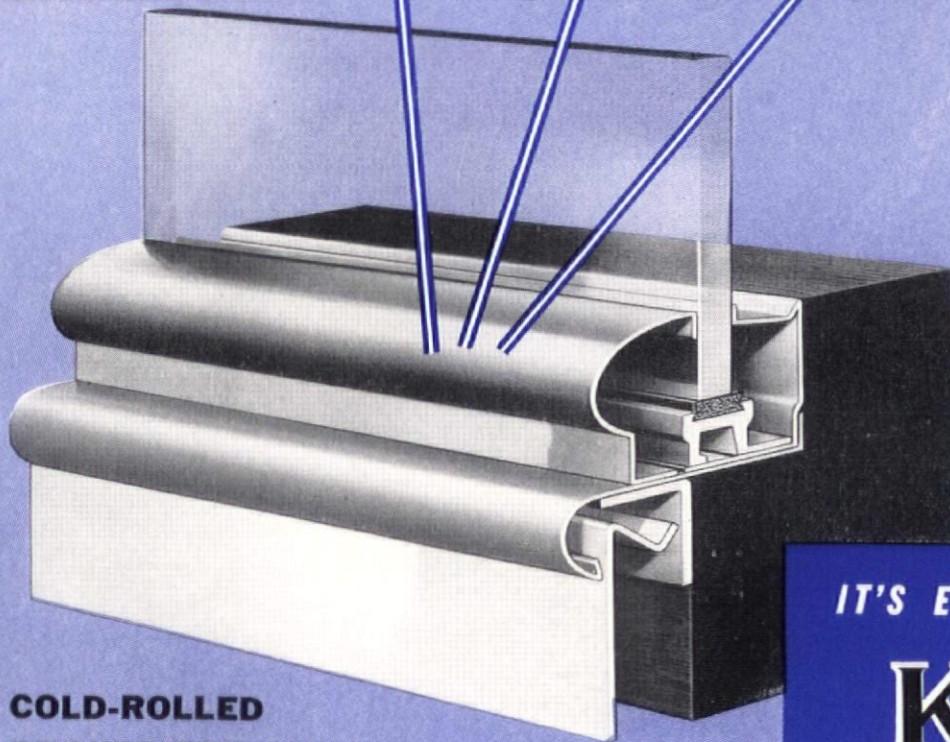
(Continued on page 12)



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FOR THE
MOST MODERN
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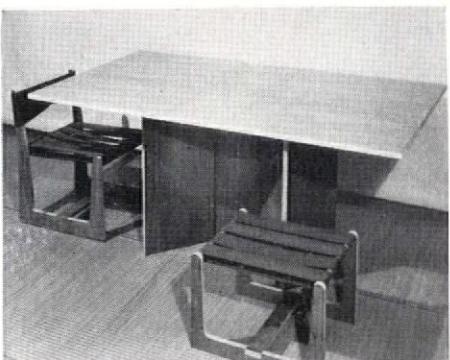
Kawneer
STORE FRONTS

FORUM OF EVENTS

(Continued from page 10)



Nyholm

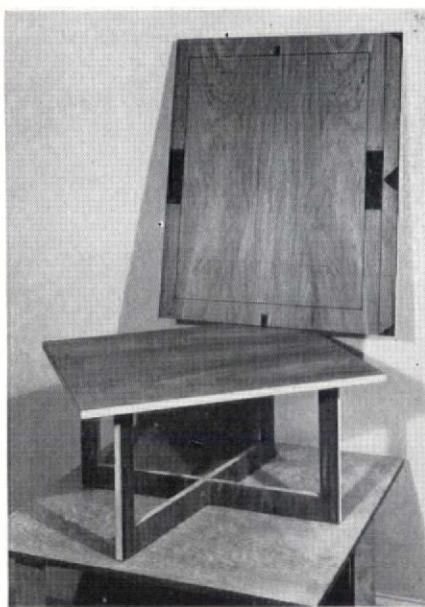


Nyholm

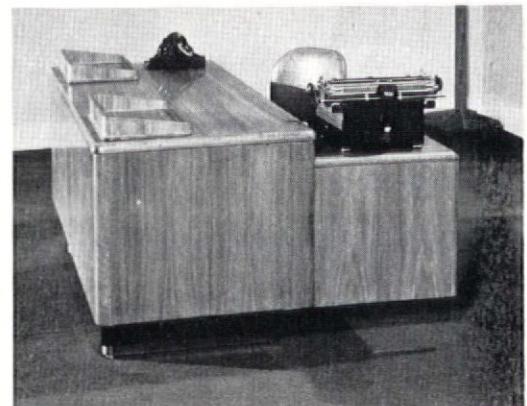
NEW FURNITURE

Furniture of contemporary design has gained tremendously in variety and assurance during the past few years, and its lines have frequently displayed an elegance generally considered the exclusive property of period pieces. Contemporary furniture, however, is largely subject to the same conditions that govern the development of contemporary architecture, and neither has yet reached that stage of maturity in which there is substantial agreement among all professionals in the field. Hence the continuing experiments and departures, three of which are shown on this page. Two are still in the model stage, one is on the market; interestingly enough, all lay stress on demountability, and, in varying degrees, flexibility.

Illustrated in the three photographs at the left are models of "Plyline" and "Structure Line" furniture developed by G. Coggeshall of New York, based on the very simple idea that good pieces can be made in their entirety out of stock plywood panels, canvas belting and screws, made and assembled by local mills from patterns or delivered in knockdown form by the manufacturer. It is expected that the furniture and patterns will be available by fall.



Nyholm



Press Photo Service Photos

Below, two views of a completely demountable desk by Antonin Heythum, Czech architect now in this country. Other demountable designs include a day-bed unit and a wardrobe. Heythum's furniture, not scheduled at present for production, would consist entirely of prefabricated pieces, is suggested as a useful adjunct to the demountable houses which may yet become an important part of the defense housing program.



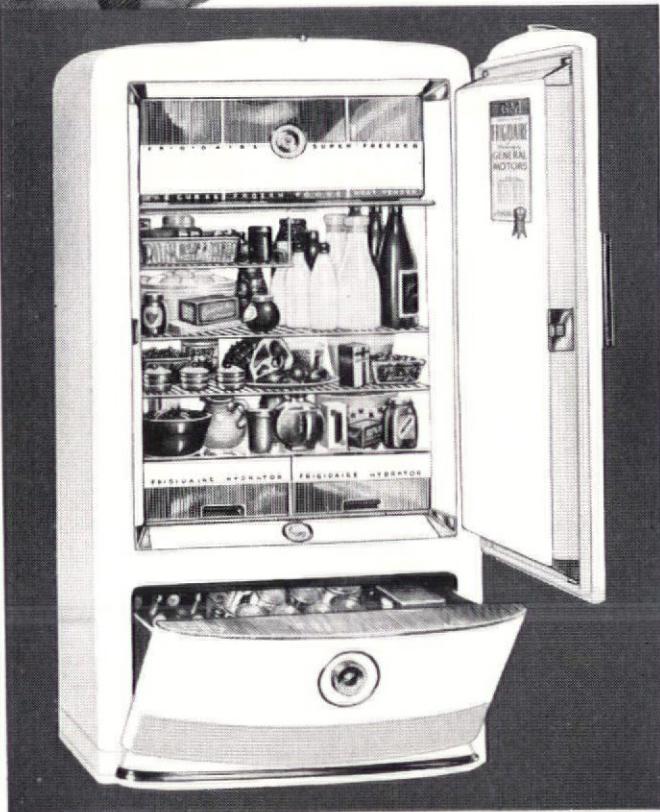
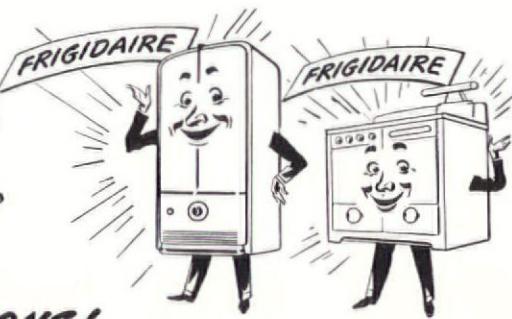
Already on the market is the convertible desk shown in the two illustrations above. Designed in the experimental shops of the Studebaker Corporation, it consists of a few standard elements — drawer units, tops, typewriter platforms — which can be combined to form any of eleven conventional types. Constructed of wood and metal, the "Convertible" offers great possibilities of flexibility and economy to large organizations. The illustrations show a table, executive-conference desk, and a typist's desk.

(Continued on page 14)



"Meet my 2 Best Salesmen!"

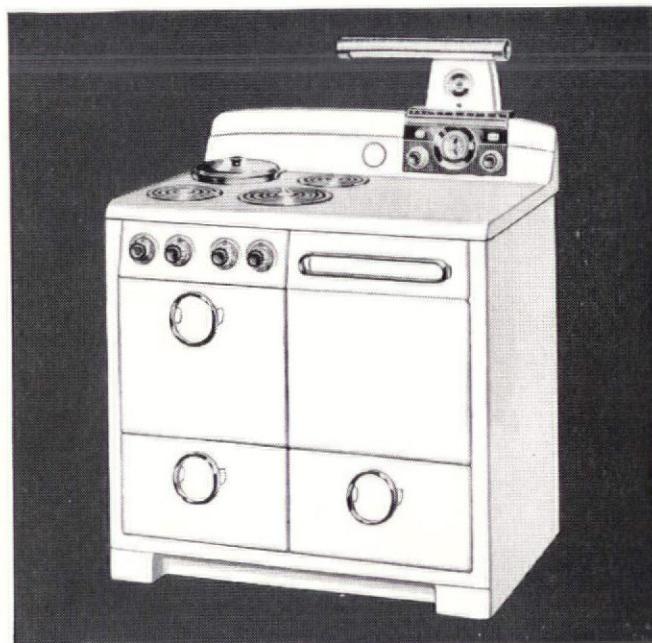
FAVORITES OF MILLIONS!



"I find there's nothing like a Frigidaire Electric Range to lend a mark of distinction to a home or apartment! It's a sign of up-to-dateness and quality that speaks for itself. When I tell prospects that they can have modern Frigidaire electric cooking, their resistance just melts away. Believe me, women really like those Radiantube units, that big thrifty oven, the handy Thermizer cooker and all the other new Frigidaire Range features."

"Frigidaire Refrigerators have closed many a 'sale' for me! When a woman makes her customary beeline to the kitchen and sees her favorite refrigerator there...why she's more than half 'sold.' And I don't blame her either. For this year's Frigidaires top everything I've seen before. They've got beauty. They've got the conveniences. And their Meter-Miser mechanism has got what it takes, too! No wonder over one-half million Frigidaires were bought in only six months of 1941."

- Special low-cost models available with standard Frigidaire features. Free appraisals on old equipment and free estimates on cost of installing new Frigidaires.



Specify the favorite - 
Specify Frigidaire

Over 6½ Million Built and Sold!

FREE! File Folder of Frigidaire Specifications!

Clip this coupon, attach to your letterhead and mail to Frigidaire Division, General Motors Sales Corp., Dayton, O. You'll get a complete Folder with specifications on all Frigidaire Household Appliances.

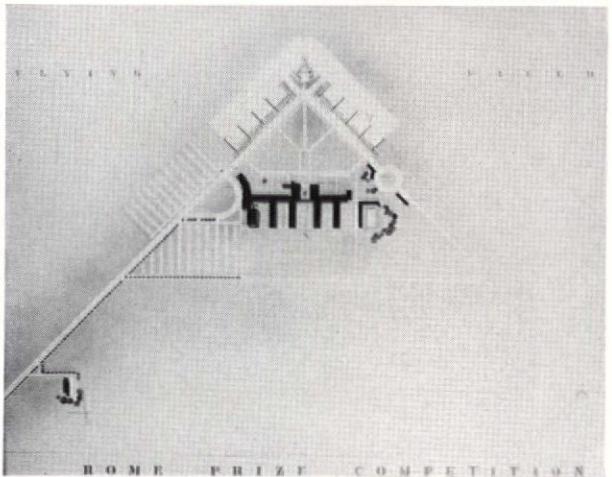
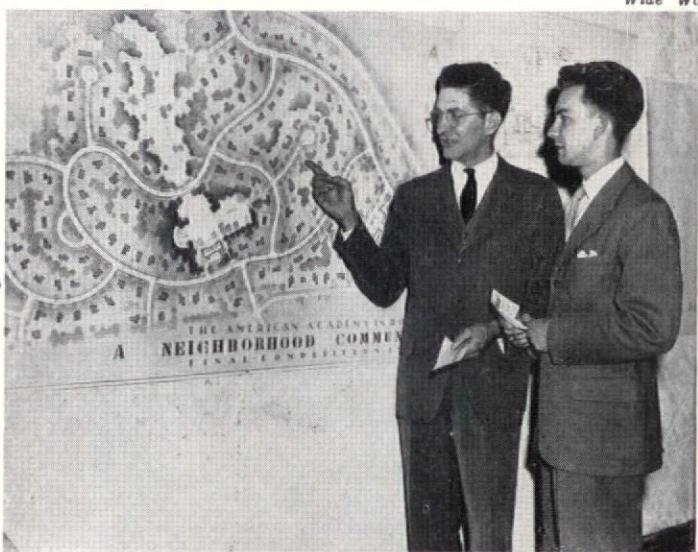
FORUM OF EVENTS

(Continued from page 12)



Kudo. Looking as though he was already planning to streamline the traditional mortar-board against headwinds, industrial designer Norman Bel Geddes receives the honorary degree of Doctor of Fine Arts from Chancellor William P. Graham of Syracuse University.

Bad luck. In place of the usual 2-3 years' study abroad, 1941's Rome Prize winners Albert Russell Tryon (above, left) and Donald L. Grieb got checks for \$1,000 each. Tryon of Penn State placed first in landscape architecture; Grieb, U. of Illinois, won in architecture with his design for an Air Corps School (right).



Emelie Danielson



Emelie Danielson



Marguerita Mergentime, textile and industrial designer who based her designs on original research into early American themes, died recently in New York. Mrs. Mergentime will be remembered by FORUM readers for her novel cooking utensils created for the Design Decade issue (Oct. 1940, p. 269) and for her striking tablecloths (above) and pottery (left). One of the collaborating designers who decorated Radio City Music Hall (1932), she arranged Lord & Taylor's exhibit "100 Years of American Design" (1937), chairmanned the Fashion Group furnishings division (1940-41). Marguerita Mergentime's personality was as refreshing as her productions. She was an unfailing friend to talented but unknown designers and her creative spirit will carry on in the work of others whom she encouraged.

(Continued on page 48)

Penberthy

A DISTINGUISHED NAME . . . A DISTINGUISHED PRODUCT

*Constructed of Copper
and Bronze Throughout*

THE name "Penberthy" has been distinguished for fifty-two years as representative of highest quality products.

Penberthy Automatic Electric Sump Pumps are distinguished for their dependability and long life wherever seepage water accumulates.

Penberthy Automatic Electric Sump Pumps are available in six sizes.

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PENBERTHY PRODUCTS IN STOCK



PENBERTHY INJECTOR COMPANY

Manufacturers of Quality Products Since 1886

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DETROIT, MICHIGAN



"Limpet's" sound absorption vastly superior
to former acoustical installation
—SAY THOSE WHO WORK IN THIS NEW OFFICE

● One of the modern offices in the Continental American Life Insurance Building, Wilmington, Del., with an acoustical ceiling of K&M Sprayed "Limpet." The office force says it is far superior to the former acoustical treatment. Installation by Acoustics, Inc., Philadelphia, Penna.

Even a battery of bookkeeping machines makes no nerve-wracking clatter in the new accounting room of Laird, Bissel and Meeds, stock brokers. It has an acoustical ceiling of Keasbey & Mattison Sprayed "Limpet" Asbestos. The former office, located in another building, had also been "sound-proofed" . . . by a different method. The office force (who ought to know!) say the "Limpet" ceiling is vastly quieter.

The new office, located in the Continental American Life Insurance Building, Wilmington, Del., had a 1" layer of "Limpet" sprayed right on the plaster. It absorbs 70% of the noise which strikes the ceiling!

At the same time, it helps provide a high degree of shadowless illumination with the indirect lighting used, because it was given a white travertine finish. A great advantage of "Limpet" is that it may be painted over and over again without impairing its high acoustical efficiency.

Sprayed from a "gun," "Limpet" sticks tight to any clean surface, regardless of shape or composition, without needing mechanical systems or gadgets. It follows the contours of curved, recessed, or irregular surfaces, and may be built up to any practical thickness to provide the specified degree of sound absorption per square foot. It gives you acoustics without geometries.

"Limpet" is light in weight, is an excellent heat insulator, and is fire-resisting and moisture-resisting. No other acoustical material offers all these advantages!

FREE . . . write
Dept. 23 for new
A.I.A. Catalogue
giving complete de-
tails on "Limpet."



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in the
USA.

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in Winterhaven
New York

"Come on down..."

IF ONLY TO SEE THIS TERRAZZO FLOOR!"

THIS beautiful floor invites you to stay in Miami at the Hotel Winterhaven. And it will be there a lifetime to welcome you with the same lovely colors.

FINE TERRAZZO made with Atlas White portland cement brings beauty and years of wear to every floor you design. You can reproduce *any* decorative pattern . . . use practically any color combination you desire. The colored marble aggregates, in a matrix of this white cement, stay fresh

and vivid. And upkeep stays at a low level.

FINE TERRAZZO will make a welcome floor for your next client. Specify Atlas White cement, plain or waterproofed, so that your colors and pattern will show to best advantage. Turn to Sweet's Catalog for details and 24 true-color illustrations of FINE TERRAZZO. Or write us for free book. Universal Atlas Cement Co. (United States Steel Corp. Subsidiary), Chrysler Bldg., N. Y. C.

OFFICES: New York, Chicago, Philadelphia, Boston, Albany, Pittsburgh, Cleveland, Minneapolis, Duluth, St. Louis, Kansas City, Des Moines, Birmingham, Waco.

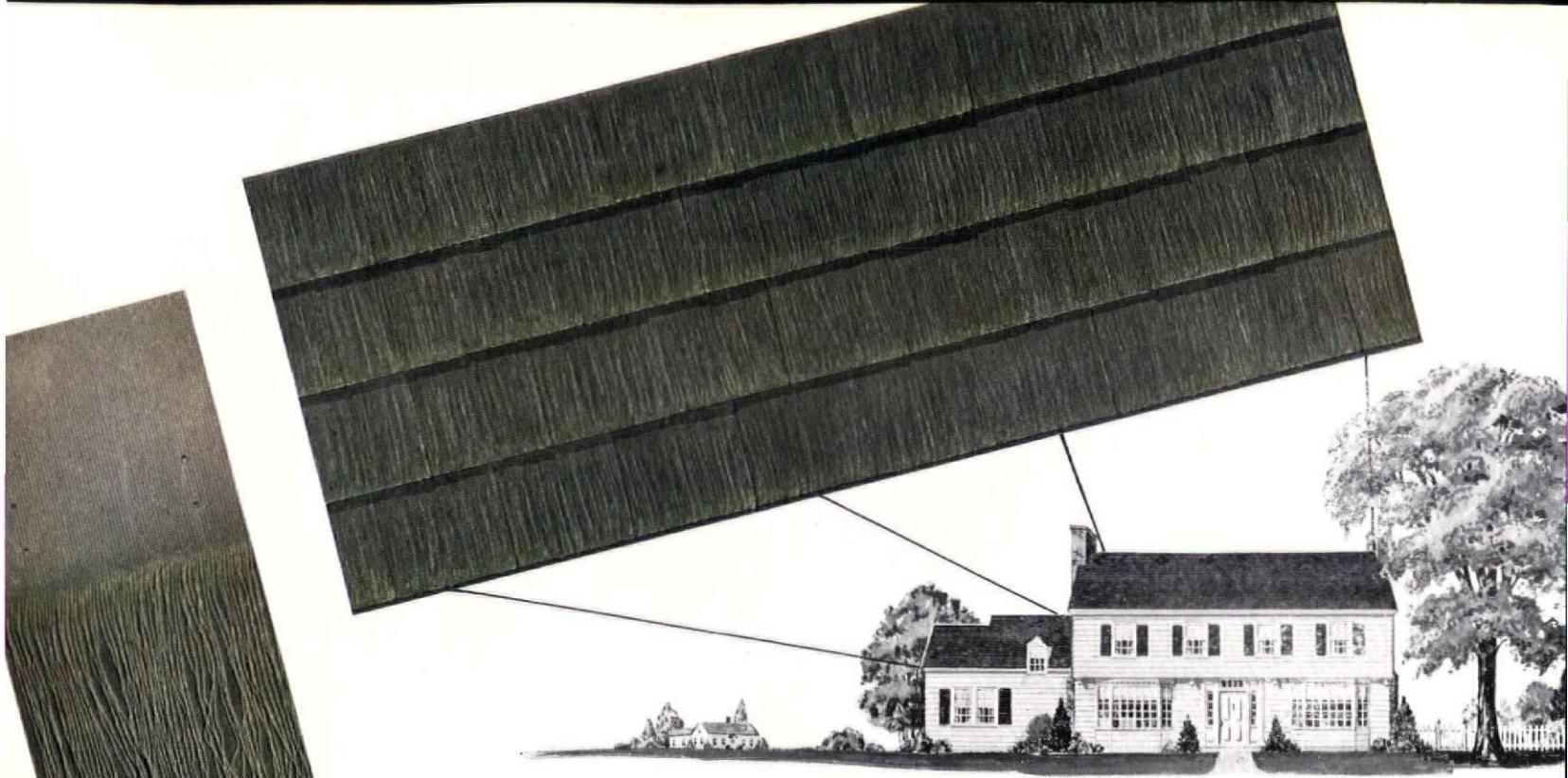
FINE TERRAZZO made with Atlas White cement in Hotel Winterhaven, Miami Beach, Florida. Marble aggregates used: Botticino; Yellow Verona; Red Rosa with red pigment; and Red Verona with red pigment. Architect, Albert Anis, Miami Beach; Terrazzo Contractor, Dade Marble & Tile Co., Miami.



FOR FINE TERRAZZO SPECIFY



ATLAS WHITE PORTLAND CEMENT



Color-Toning . . .

lets you decide
how the roof should look

K & M "Century" Color-Toning opens up a vast unexplored field. It places within your sure control the color of every roof. You can improvise or experiment with roof tones and color blends, create exactly the effect you wish . . . and see the result translated faithfully into reality on the finished home.

What is more, the process is exceedingly simple, made so by the Keasbey & Mattison development of Color-Toning. K&M "Century" No. 92 asbestos-cement roofing shingles, in the special range of tones shown at the left, are reproduced as miniature gummed paper shingles in actual colors. With the K&M Architects' Color-Tone Work Kit, you can create the roof on paper, show your client how the finished roof will look, and be certain the roofer can duplicate it without fail.

Only Color-Toning offers all these advantages. For the first time, it

gives you a palette of roof tones with which you can work freely. It offers your clients new beauty and individuality in their homes. It insures a fire-resisting, weather-resisting roof, with all the lifetime economy of enduring asbestos cement. And for builders, it provides a new and inexpensive way to obtain pleasing architectural variety in residential operations.

Color-Toning is exclusive with K&M "Century" No. 92 roofing shingles. Other K&M "Century" asbestos-cement shingles, both roofing and siding, are available at even lower cost to insure lasting protection against fire and the elements.

FREE—Architects' Work Kit for the visualization of Color-Toned roofs. Write Keasbey & Mattison Co. . . . Address Dept. OI.



KEASBEY & MATTISON
COMPANY, AMBLER, PENNSYLVANIA

The Lindenwold Shingle (above) was reproduced directly from a full-size shingle reduced 6 times in size. The swatches show the eight other colors in the same reduction. Notice the beautiful graining.



IT'S THE LEAD WE MINE, AND THE MORE THE BETTER, SAY SKILLED PAINTERS

No structure can keep its looks for any length of time unless it's protected by a paint that stands up to weather. That's why for years architects have specified paints made with white lead.

You see, white lead is derived from lead—and everyone knows what a tough, time-resisting metal that is!

Paints made with white lead are long-lasting, too. They're indifferent to blistering heat and biting cold—to rain, snow or anything else the weatherman serves up. You don't see any cracking and scaling on

white-lead-painted jobs. The paint wears down gradually, keeps its smooth surface.

So when you specify paint, be sure to know how much white lead it contains. It's a good rule to follow: *The more white lead, the better the paint!* You can't, for example, get a more durable paint than a 100% white lead paint. This is the kind good painters mix from lead-in-oil.

And don't let the name fool you. White lead paint can be tinted to virtually any popular color.

White lead paint cloaks your work in an enduring beauty that gratifies clients. Yet, surprisingly, it costs no more than regular quality paints. All of which goes to prove the old maxim, "The best is cheapest."

LEAD INDUSTRIES ASSOCIATION
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TIPS ON COLOR STYLING
—You'll find this and other useful paint information in a free booklet, "WHAT TO EXPECT FROM WHITE LEAD PAINT." Send for a copy today.

You're money ahead when you paint with

White Lead

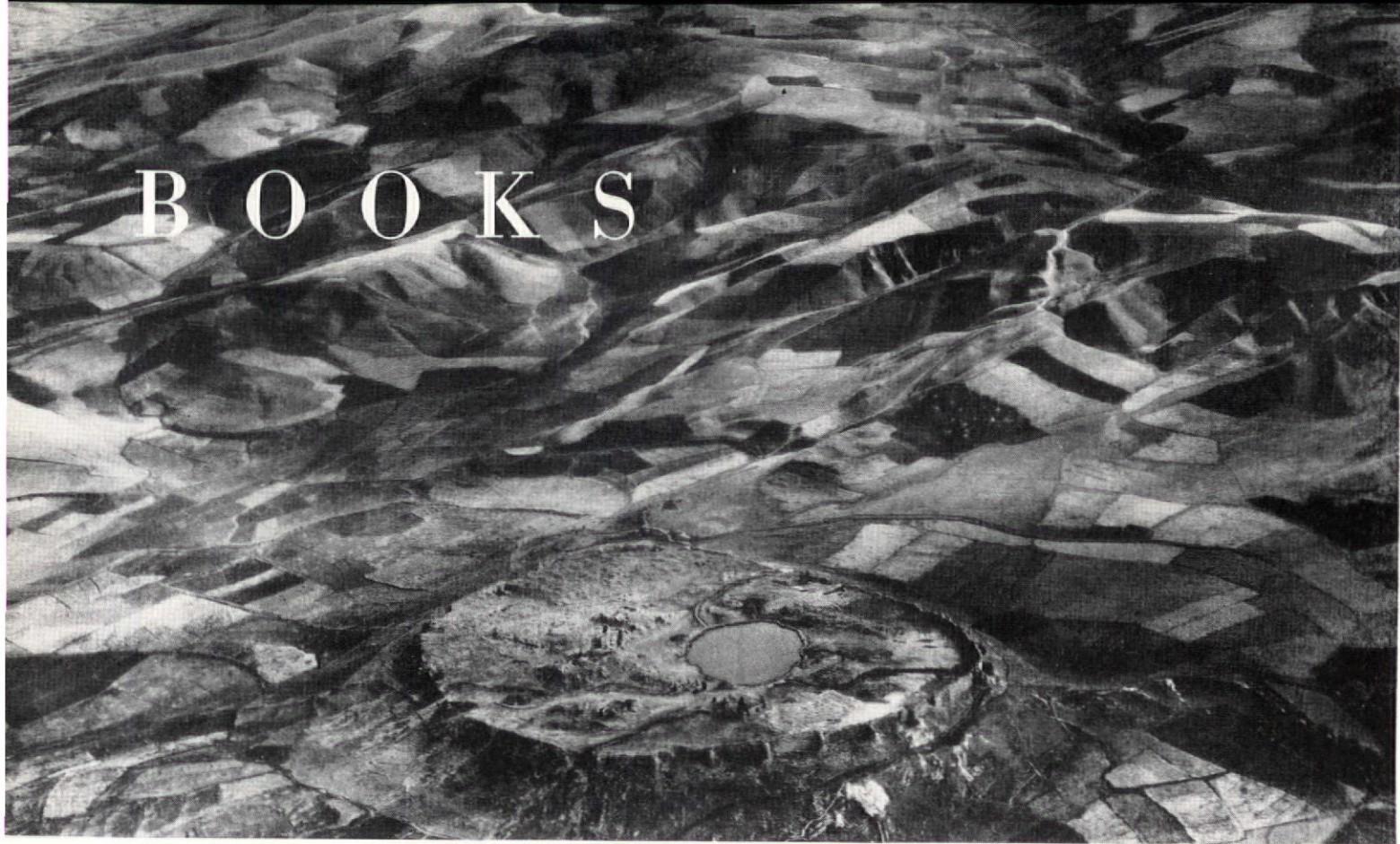


OLD STAND-BY IN NEW FORM

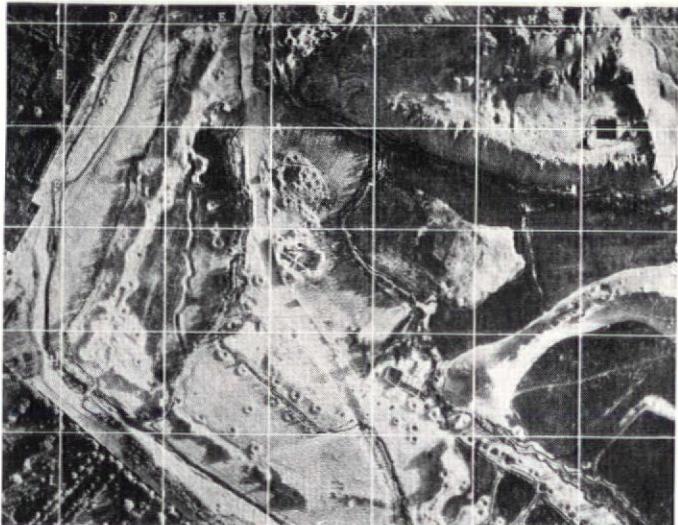
In addition to the familiar paste form, your contractors can now obtain pure white lead as a ready-to-brush paint, in convenient, popular-size containers, at dealers' everywhere.



BOOKS



TAKHT-I-SULAIMAN, RUINS OF THE "THRONE OF SOLOMON"



GOVERNMENTAL QUARTER AND CITADEL OF RAYY



EXCAVATION OF QUASR-I-ABU NASR

FLIGHTS OVER ANCIENT CITIES OF IRAN, by Erich F. Schmidt.
The University of Chicago Press, 103 pp., 119 plates. 12 x 16. \$20.00.

For years the Oriental Institute of the University of Chicago has been conducting archaeological investigations all through the Near East, working on a scale that has been the despair of older and less lavishly financed organizations in the field. The houses at its various base points have been magnificently built and equipped, frequently taking on the character of desert fortresses complete with power plants and woodworking shops down to individual showers. At Sakkara, for instance, where a series of Egyptian bas-reliefs was recorded, the darkroom had one of the biggest enlarging machines ever built. The reliefs were photographed and enlarged, outlines of the figures and symbols were drawn in India ink directly on the photographs, and when the photographic image was finally washed off the prints, there remained absolutely precise records in line drawing. This was a far cry, in both speed and accuracy, from the old method of putting a draftsman in front of a carving and telling him to record what he saw. Today's archaeologist differs as much from his predecessor as the geo-physicist, equipped with delicate torsion balances and electrical measuring devices, differs from the old-time prospector with his pick and shovel.

The Oriental Institute was not the first to use the airplane and aerial camera for archaeological purposes, but it is probably the first to have organized air survey work on such a scale. The enormous possibilities of the method are apparent when a comparison is made with normal procedure, which entails the moving of large crews, quantities of equipment, erection of buildings, etc. With the airplane, aerial mapping is a matter of minutes, and the only ground preparation necessary is the placing of markers which form a grid of 100-meter squares. These are later connected by lines on the finished photograph (see illustration), forming the basis for an accurate drawing. With the use of stereoscopic devices, the contours of the site can be studied at leisure. The author and his collaborators mapped more than 400 sites in the plain of Persepolis in thirteen flying hours, a work that under other conditions would have taken years.

(Continued on page 60)



For homes designed to stay NEW!

SPECIFYING Goodyear Wingfoot Rubber Flooring is one sure way of helping a home or other building retain its fresh look of newness longer.

The bright, attractive appearance of this flooring recently installed in the new Golden Homes at Baldwin, Long Island, for example, will not be lost despite long use and many washings.

That's because the colors of Wingfoot Rubber Flooring are fast—and they are not marred by match burns or even by most acid stains.

The busy housewife will find that the surface of this flooring remains resilient—is always comfortable and quiet to walk on—and that it lies flat without warping or stretching.

Architects will find they can use its designs and color combinations to blend with any surroundings—and that it can be installed in either sheet or tile form.

For complete specifications, see Sweet's Catalog or write to Goodyear, Akron, Ohio—or Los Angeles, California.

Wingfoot—T. M. The Goodyear Tire & Rubber Company

THE GREATEST NAME IN RUBBER

GOOD  **YEAR**

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CALL UP THE MINUTE MEN

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These men are at your command the minute you ask for them.

Through these men—the Revere Architectural Technical Advisors—Revere Copper and Brass Incorporated is prepared to cooperate with architects in the selection and application of sheet copper, Rocan—the improved copper,

and Roofloy—a new, lightweight creep resistant lead roofing; also in the application and selection of the many other Revere Architectural products such as extruded shapes and panel sheets, copper water tube and brass pipe.

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SAMPLES

Samples of the various Revere roofing products, including commercial sheet copper, Rocan copper and Roofloy, will be gladly sent upon application to Revere Executive Office at 230 Park Avenue, New York, N. Y.

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Parkdale Housing Project, Great Falls, Montana. Angus V. McIver, Architect; A. T. Klemens & Son, Heating Contractors.

**You save money for your clients
— and earn their lasting gratitude**

... with **MUELLER** furnaces

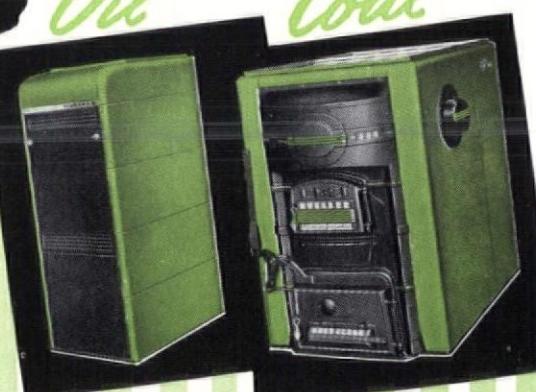
"sized" to the home

Equipped with 156 Mueller Series SHP Gas-fired Winter Air Conditioning Furnaces. Typical installation shown at right.

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Oil Coal



New SERIES OVP Vertical Oil-fired Winter air conditioner. Equipped with efficient, trouble-free Mueller Vaporizing Oil Burner.

SERIES FB Coal-fired Winter Air Conditioner — matching in appearance Mueller's automatic oil and gas furnaces.

It's MUELLER for all three fuels — coal, gas or oil

Mueller furnaces are specially designed for each type of fuel — therefore cost less to operate . . . Unbiased — offering the industry's most complete range of sizes, types, and prices — Mueller is the logical

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LETTERS

GRAIN BIN HOUSE



Forum:

In your article on the Butler-Fuller grain bin house in the June FORUM, you state, "Interesting is the close parallel between Inventor's Fuller's projected solution to the low cost house problem and that devised by Architect-Educator Martin Wagner. But Fuller's house was conceived before Wagner's theories were disclosed."

That statement is untrue. When I was a student at the Harvard School of Design I had the privilege of knowing Architect-Educator Wagner and also Designer-Partners Rex Allen, Arthur Malsin, and Edward Too. At that time, (1938-40), not only the design but also the constructional features of Prof. Wagner's igloo houses were fairly well established and known to the school. An article describing the houses and showing a picture of them was published in the Sunday N. Y. Times; I think in "The World of Science" department. I am unfortunately unable to remember the date of that publication but it couldn't have been later than February, 1940, and might have been as early as the winter of 1938-39. My guess would be about December, 1939. At any rate, it was long before the house finally made THE FORUM. Of the grain bin houses, nothing was heard from Allen and Malsin and Too. And it couldn't have been heard of, for, according to THE FORUM's own statement, Mr. Fuller conceived the idea only last November, at least eight months and possibly a year later than the first publication of Prof. Wagner's igloos.

May I object also to the inconsistency of THE FORUM's criticism of the two houses. THE FORUM's criticism of Mr. Fuller's was limited to the sacrifice of privacy, and its steel construction. Otherwise the article is more or less on the paean of praise order. THE FORUM was quite skeptical of the igloo houses. Among its criticisms were:

1. "Large scale production of MW houses would disrupt the housing industry, put most manufacturers, dealers, builders, designers, and laborers out of work."

Why isn't this also true of the Fuller house?

2. "Low income families could not afford the land cost, and it would not be eco-

DEFENSE HOUSING, cont'd.

It seems many months ago—actually it was March—when this department first engaged various Government officials in correspondence about Defense Housing. Burden of THE FORUM's complaint: 1) private architects were not being used, 2) prefabrication was being scuttled, 3) local builders experienced in house construction were being ignored. It is now proper to report progress, to credit FWAdministrator Carmody with decisive action on at least two of these three fronts. Into the old Treasury Department plan mill (now PBA) no new projects are going. Instead a new division of FWA is taking on many, (see page 8) and in every case, calling in private architects for site planning and housing design. Certain projects are being frankly treated as experimental, and the architects are being given wide latitude in developing them. USHA which has always used private architects continues to make a good defense record. Prefabrication is now definitely in the picture. At mid-June more than 12,000 prefabricated units had been ordered with more to follow. But chief significance of these new policies could only be gauged when related to the second half-billion dollar defense housing program now a-cooking in Coordinator Charles F. Palmer's kettle. If private architects and prefabricators turn in a good performance now, as undoubtedly they will, the bulk of the next appropriation should be theirs.

Interesting to note is the discovery of the architect, belatedly made in England. The following item appears in the May issue of the London "Building": "The shortage of architects is becoming acute. On the national principle of trying out all the wrong ways of doing things first before coming to earth and behaving rationally, the great white building chiefs have now discovered that the profession, as a whole, is remarkable for its integrity and for its vast capacity to plan and control the complicated machinery of building. There would have been no camp building scandal if this brilliant discovery had been made 18 months ago."—ED.

nomical to put a \$670 house on a lot big enough for the eventual addition of three or four room units."

Why isn't this also true of the Fuller house?—except that Mr. Fuller—guided perhaps by this criticism—did not provide for additional room units.

3. "It appears that the major reason for the low cost of basic MW houses lies in its small size rather than its unusual construction."

Why isn't this true also of the Fuller houses? The selling price of the MW house

is \$670. The selling price of the Fuller house is \$1,000. The MW house contains 218 sq. ft.; the Fuller house, 314 sq. ft. (a cubage basis of comparison is irrelevant, since height added over and above 8'-6" or 9'-0" adds little or nothing to the comfort or livability of a home). On a square foot basis, the Fuller house costs \$3.18; the Wagner home only \$3.07. It seems that possibly the reason for the low cost of Mr. Fuller's house lies in its size.

BELL KNAPP

Miami Fla.

Answers to questions: (1) It would be, if production and acceptance were great and sudden. (2) Fuller's houses are more compact, use less land. (3) Wagner's houses are on paper; Fuller's are on sale.—ED.

Forum:

In THE ARCHITECTURAL FORUM of February, 1941, page 87, there appeared a description of some houses, designed by Martin Wagner, which are circular in plan. The illustrations also show several of these units joined into a group by means of connecting passage-ways.

This design is strikingly similar to the African huts at Christiansburg, Va. which were built by Mrs. E. L. Rice, the widow of a missionary who, in 1912, taught tobacco growing in Rhodesia, South Africa. After her husband's death she came to Virginia, and wanted to live in huts like those they had used in Africa; not only because of



MARTIN WAGNER IGLOOS



ROANOKE, VA., 1912

sentiment but because she liked that style of dwelling. She modified the construction to accord with the materials here available and with the difference in climate.

The group consists of four circular brick huts; the middle one being 20 ft. in diameter, and the others 16 ft. in diameter. These are connected by short passage-ways.

Heating buildings of this type is difficult because of the large exposed area of out-
(Continued on page 68)



AMERICAN AIR LINES

GET BETTER LIGHT *Fast-Economically*
TO SPEED VITAL OPERATIONS



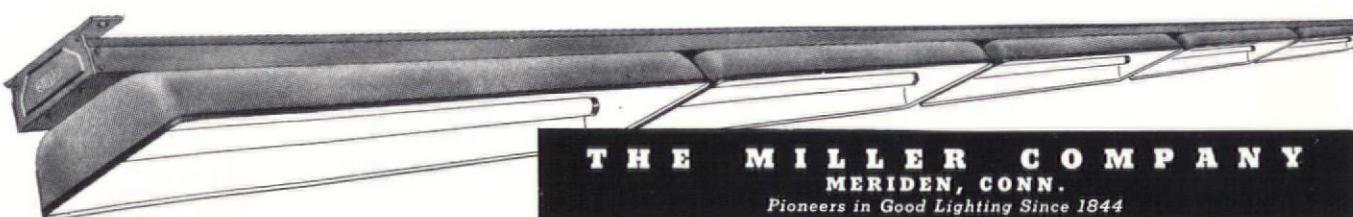
"NERVE CENTER" of great American Air Lines at LaGuardia Field, N.Y. is this busy Reservation Room. For maximum worker efficiency it is lighted with IVANHOE "50 FOOT CANDLER" recessed in the ceiling, providing fine, well-diffused fluorescent lighting.

with IVANHOE
"50 FOOT CANDLER"
RLM Continuous Wireway
FLUORESCENT
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**TODAY WITH DEFENSE IN THE DRIVER'S SEAT, THIS BETTER FLUORESCENT
LIGHTING SYSTEM CAN INCREASE YOUR PRODUCTION—HELP CUT COSTS**

• IVANHOE "50 FOOT CANDLER" went to work for American Air Lines quickly and economically. It can do as much for you. This new and better lighting system is engineered that way. Its built-in wireway contains up to 80 per cent of necessary building wiring. Cuts installation costs from 30 to 50 per cent. Permits people to go right on working while system's going in. Maintenance? A cinch—with conveniently removable reflectors.

These benefits to users are benefits to you as well. They mean substantial savings of time and money for clients. They mean the best possible lighting at the lowest consistent cost. They mean more "building dollars" left for other specifications. We developed "50 FOOT CANDLER" (the first RLM Continuous Wireway Fluorescent Lighting System) with these things in mind. Write for details in Bulletin 1C.



THE MILLER COMPANY
MERIDEN, CONN.
Pioneers in Good Lighting Since 1844



Does **MENGEL BORD** “*Dress Up*” *a Room?*

Most people would think of a \$5800 house as offering little opportunity for real decorative charm. Yet here is the living room of a \$5800 home that was made *outstandingly attractive* by adding a single wall panelled with Mengel Bord!

This particular panelling is *Mahogany* Mengel Bord. It could just as easily have been Gum, Walnut, Birch or Oak. But the point is—for no more than a few extra dollars at most, Mengel Bord can often give you

Better, More Economical *Flush Doors* by Mengel!



Mengel Flush Doors are so superior that in guaranteeing them, we also guarantee even the cost of the installation! And they're so much *more economical* that you can budget them for even the smallest job! . . . Let us send you the facts. Check the coupon!

effects and values that will literally *transform* your jobs.

Mengel Bord is $\frac{1}{4}$ ", hot-plate, resin-bonded plywood, in big 48"x96" panels, with the grain running the long way. It is available in three grades, for every kind of interior use. It is 100% genuine hardwood, yet costs little more than softwood!

Let us give you all the facts about this amazing new panelling. No obligation of any sort. Use the coupon below!

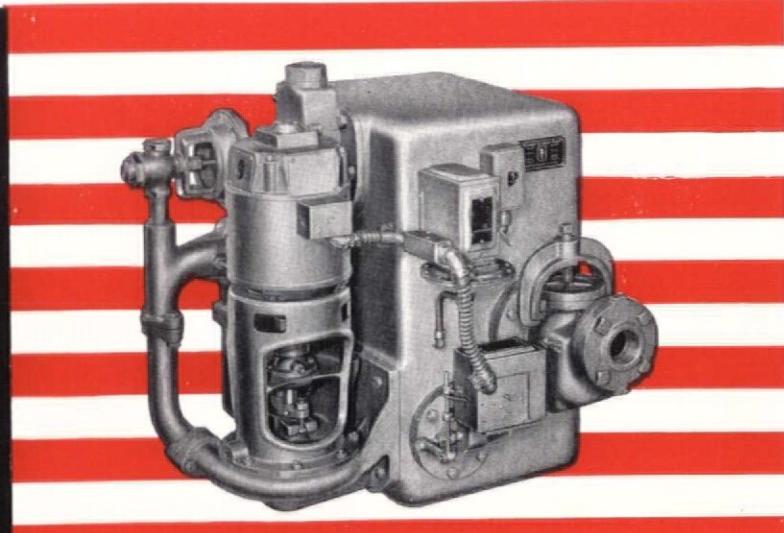
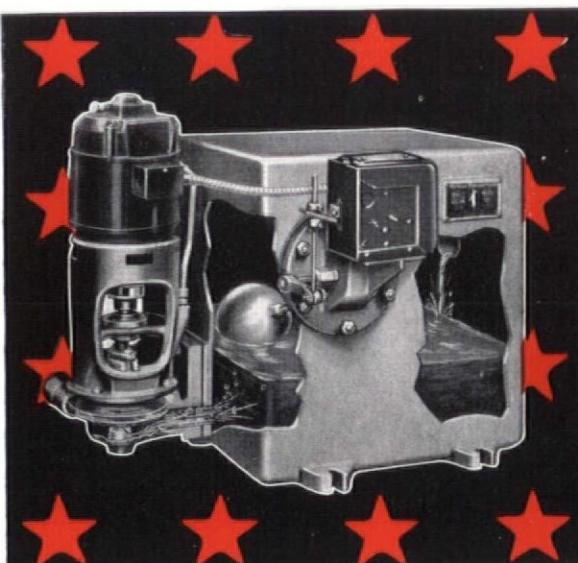
The Mengel Company, Incorporated
1126 Dumesnil Street
Louisville, Kentucky

Gentlemen: Please send me, at once, full information about Mengel Bord . . . Also about Mengel Flush Doors

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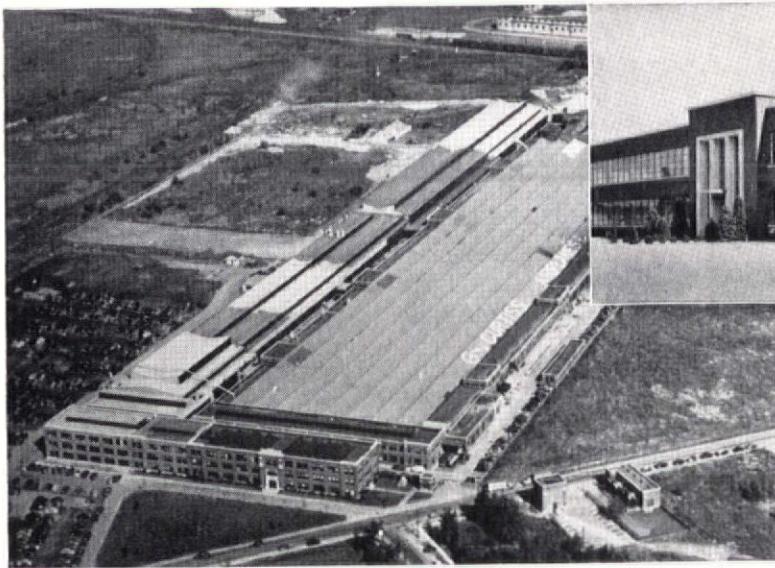
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HOFFMAN-ECONOMY PUMPS

do their bit in National Defense Plants



Curtiss Wright Airplane factory at Buffalo, N. Y.



Vultee Aircraft, Inc., Nashville division

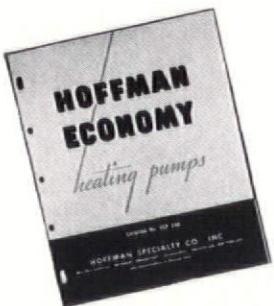
National defense puts a new premium on plant efficiency . . . an urgent demand for elimination of weak links in the productive chain!

Here, in these airplane factories, Hoffman-Economy Pumps are assigned the job of keeping the heating system up to par. Because in both the Vacuum and

Condensation types of these pumps are features of design, material and workmanship which are inherent guarantees of dependable service.

Hoffman-Economy Pumps offer a sturdy defense against half-effective heating system operation. Their record in thousands of installations is concrete evidence of their ability to remove air and condensate under severest operating conditions.

This line of heating pumps is America's most complete! No matter what your pumping requirements are, somewhere among the many Hoffman-Economy Pump models you will find the right type, right capacity and right price!



SEND FOR THIS CATALOG
Contains complete descriptions and engineering data on Hoffman-Economy Condensation and Vacuum Pumps.

HOFFMAN
SPECIALTY CO., INC.

Dept. AF-1 • WATERBURY, CONN.

VACUUM AND
CONDENSATION PUMPS . . .
TRAPS, VALVES . . . HOT
WATER CONTROLLED HEAT
*Sold everywhere by
leading wholesalers of Heating
and Plumbing equipment.*

IN Defense Projects

EXPANDED METAL



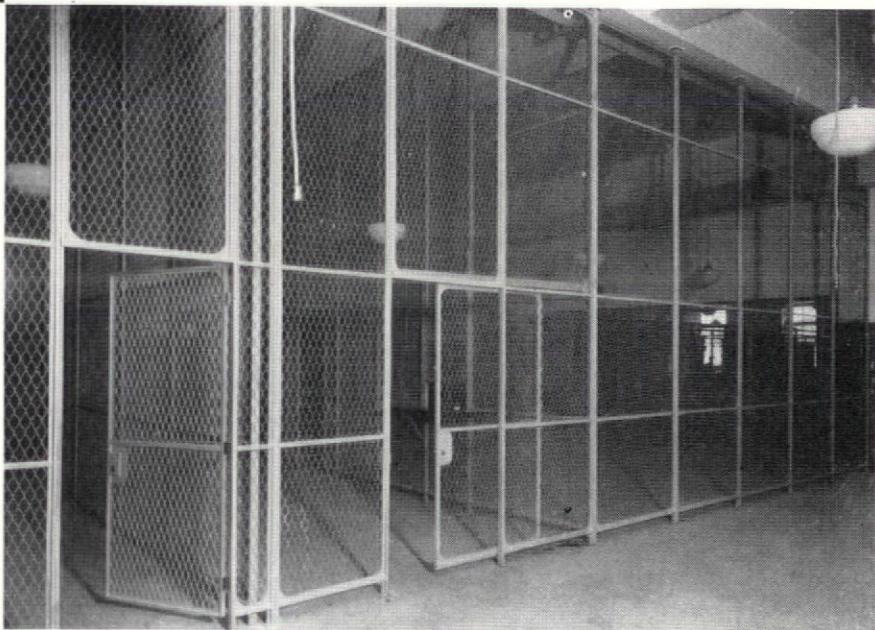
PROVIDES NEEDED PROTECTION
at Low Cost

BECAUSE of its great strength, light weight, low cost, and adaptability to many uses, Steelcrete Expanded Metal is being extensively used in defense projects for protection against theft, glass breaking, illegal entry or exit, or acts of sabotage. The rigid strands of Steelcrete Expanded Metal cannot be pried apart and will not unravel. Meshes with openings of various sizes for any type of protection are available. Suitable fittings are also provided for quick installation of window guards, skylight guards, partitions, lockers, and other types of enclosures.

Write for New 92-Page Handbook on Expanded Metal

Steelcrete Expanded Metal window guards are made in several styles to harmonize with any architectural design. They are finished in baked enameled paint in any color desired for use on office buildings, industrial plants, apartment houses or other types of structure. The style shown here is a combination fixed and binged window guard, made of 1½" No. 9 Steelcrete Safe-T-Mesh and Jumbo Bar frame.

Enclosures made of Steelcrete Expanded Metal can be quickly erected and easily altered should plans change later. The open mesh of Steelcrete makes for better ventilation and better light distribution. This strong, fire-safe fabric is ideal for use in partitions, locker-rooms, storage rooms and tool-room enclosures as shown at the right. All necessary accessories, including hinges, frames and vertical supports are available.



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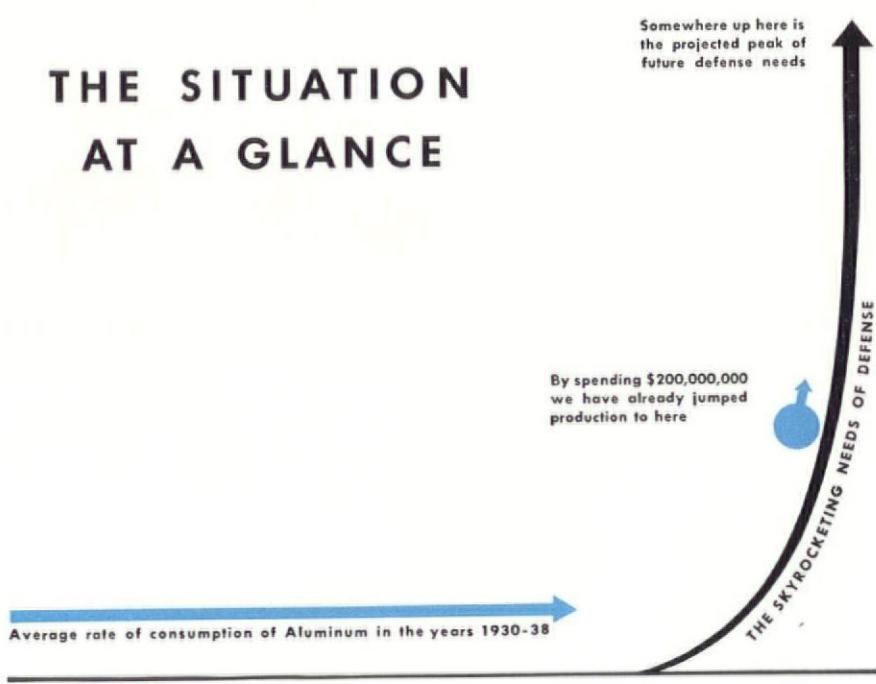
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ALUMINUM, DEFENSE, AND YOU

4

THE SITUATION AT A GLANCE



ONLY TWO OR THREE YEARS AGO, peace-time consumption was down around the level of that horizontal blue line.

NOTWITHSTANDING, even before the tragedy of Dunkerque started Americans thinking in terms of scores of thousands of planes, Alcoa went "all out" with a program which will mean the expenditure of nearly \$200,000,000 of its own capital, so as to be ready for unprecedented demand.

THAT IS EXACTLY WHY defense is getting NOW every month, millions of pounds more aluminum than was officially anticipated would be necessary. We produced 50,000,000 pounds last month against an average of 14,000,000 during the peace-time years 1930-8.

ALTHOUGH WE ARE GOING AHEAD with further expansion because of an unforeseen need for aluminum, we are a bit proud that through our efforts to date, present defense needs are being met *in full*.

THE SECOND GUESS, like hindsight, is always more intelligent, even when its figures are almost astronomical.

BUT IT WAS THE COURAGE to spend our own money, before there was time for a second guess, that is delivering the aluminum for defense today.

ALUMINUM COMPANY OF AMERICA



R

Give existing buildings
intra-mural injections of
DENSHEATH*



**Anaconda's small diameter building wire
ideal for electrical modernization
using existing raceways**

BUILDINGS, LIKE PEOPLE, once in awhile need a shot in the arm to make them healthy and productive. With Anaconda's Densheath, an improved SN type of small diameter building wire, you can remedy one of the greatest deficiencies now existing in the constitution of old commercial and industrial buildings.

By rewiring existing raceways with Densheath, wattages can be increased *for the cost of only the wire and the labor!* For example, it is possible to increase wattage from 2,760

watts to 10,368 watts by using eight Densheath building wires in place of four Type R wires and changing the system from 2-wire, single-phase to 4-wire, three-phase.

There's new life for old buildings in Anaconda Densheath. Use it in your plans for electrical modernization.

*Reg. U. S. Patent Office

ANACONDA WIRE & CABLE COMPANY,
General Offices: 25 Broadway, New York City;
Chicago Office: 20 North Wacker Drive. Subsidiary
of Anaconda Copper Mining Company. Sales Offices in Principal Cities.



**USE MODERN
IMPROVED**

ANACONDA WIRE & CABLE

COMPARE THE NEW AND THE OLD!

Note this 105% wattage increase

1" CONDUIT

BEFORE



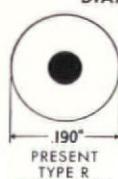
AFTER



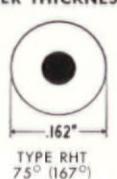
4—No. 8 TYPE R
100% Copper
28 Amp. 9,660 Watts

4—No. 4 TYPE SN
(Densheath) 250% Copper
57.6 Amp. 19,872 Watts

**INSULATION SPECIFICATIONS AND
DIAMETER THICKNESSES***



PRESENT
TYPE R
50°C (122°F)
All Sizes



TYPE RHT
75° (167°)
Sizes
14-12-10-8
for rewiring
purposes



TYPE SN
Anaconda
Densheath
60°C (140°F)
Sizes 14 to 4/0
inclusive for
rewiring only

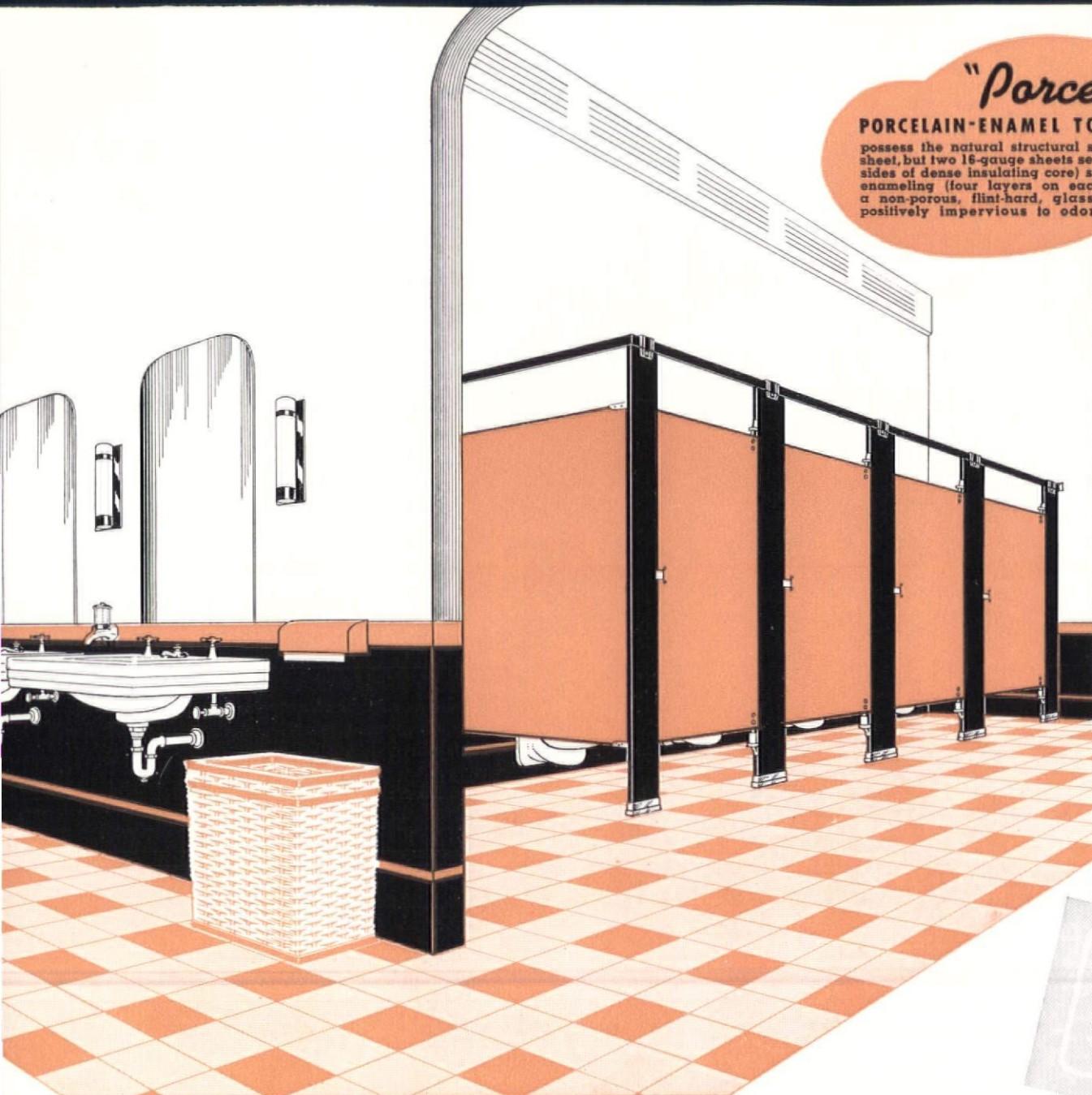
*From Anaconda's "The Story of 1940 Code Changes." Ask for a copy.

41368

"Porcena"

PORCELAIN-ENAMEL TOILET PARTITIONS

possess the natural structural strength of steel, (not one sheet, but two 16-gauge sheets securely bonded on opposite sides of dense insulating core) strengthened by porcelain-enameling (four layers on each sheet) which provides a non-porous, flint-hard, glass-smooth surface that is positively impervious to odors, acids and moisture.



CHOOSE FROM THESE TYPES

THE TOILET PARTITION THAT IS NEEDED
TO MAKE A TOILET ROOM ENVIRONMENT
LIKE YOU WANT IT TO BE

THE AGENT TYPE
THE CANTILEVER TYPE
THE HINGED TYPE
THE PLATE TYPE
THE ROLLER TYPE

WITH five types of Toilet Compartments to choose from, all available from one source, even the pressure of building for National Defense, involving widely varying requirements, can be met with reasonable promptness. The availability of these five types of Toilet Compartments classifies common treatments of toilet room interiors as outmoded.

Toilet room interiors have a powerful influence on the mental attitude of all types of workers, whether in offices or in factories. Toilet Compartments are a major unit in giving a toilet room interior that influence which promotes orderliness and cleanliness.

Sanymetal's five distinct types of Toilet Compartments and three finishes, particularly "Porcena" (porcelain-enamel) finish, provide unlimited possibilities for the installation of modern toilet room treatments in all types of administrative, educational and industrial

buildings. Three of these five types of Toilet Compartments are available in three different finishes; two types are available in two different finishes. "Porcena" (porcelain-enamel) finish is a glass-hard, stainless material that always looks new, does not absorb odors, is moisture-proof and rust-proof, and resists the corroding nature of ordinary acids.

Sanymetal Toilet Compartments embody sound, simple and exclusive construction features that make for easier installation, and insure faultless sanitary service throughout the years to come. These features represent over 25 years of research and experience in making well over 50,000 installations.

The Sanymetal Representative in your territory is qualified as a consultant because of his wide and varied experience in developing modern toilet room treatments for all types of buildings. Consult him. Write for new Catalog No. 78.

Architects and Engineers may choose from Sanymetal's five types of Toilet Compartments the one that offers the particular design characteristics needed to make a toilet room interior suitable to a certain type of building, and the individuals who use it.

For a full description of all five types, refer to Sanymetal Section 20/22 in Sweet's for 1941



THE SANYMETAL PRODUCTS CO., INC. • 1687 Urbana Road, CLEVELAND, OHIO

Sanymetal TOILET AND OFFICE PARTITIONS

**THIS MODERN
BUILDING HAS A**

Long Life Line



General Electric Office and Warehouse Building, Los Angeles, Calif.—Architect: Albert C. Martin

IT HAS TONCAN IRON ARTERIES FOR HEATING AND VENTILATING



In this West Coast office and warehouse building, there's more than beauty that appeals to its owners. It's designed and built with long-lasting protection against costly maintenance and premature replacement of its heating and ventilating duct work—with rust and corrosion-resisting Toncan* Iron.

There's every reason why *you* should specify Toncan Copper-Molybdenum Iron on jobs like this, too. Containing twice as much copper as copper-bearing steel, it has greater rust- and corrosion-resistance than any material in its price class. It gives years of longer service without maintenance—puts an end to premature replacement costs that mean double expense, for tearing out the old duct work, for putting in the new. And Toncan Iron is uniformly ductile, easier to work—saving on building costs.

When these facts are known, most of your clients will gladly pay the few extra dollars it costs to get all those money-saving advantages of Toncan Iron.

Get the up-to-date facts about Toncan Iron, its features, applications and other data contained in the new booklet "A Few Facts About Toncan Iron for Architects and Engineers." Drop us a line. In the meantime, see Sweet's 13/6.

REPUBLIC STEEL CORPORATION

General Offices: Cleveland, Ohio

BERGER MANUFACTURING DIVISION • CULVERT DIVISION • NILES STEEL PRODUCTS DIVISION
STEEL AND TUBES DIVISION • UNION DRAWN STEEL DIVISION • TRUSCON STEEL COMPANY

*Reg. U. S. Pat. Off.



BREAKING RECORDS

The men in Republic plants are breaking production records every month in an all-out effort to speed up defense.

At the same time, they are furnishing as much steel as possible for other important uses.

The people in the communities in which these plants are located take almost as much pride in these accomplishments as the men themselves. So do we—and so, we believe, do the American people as a whole.

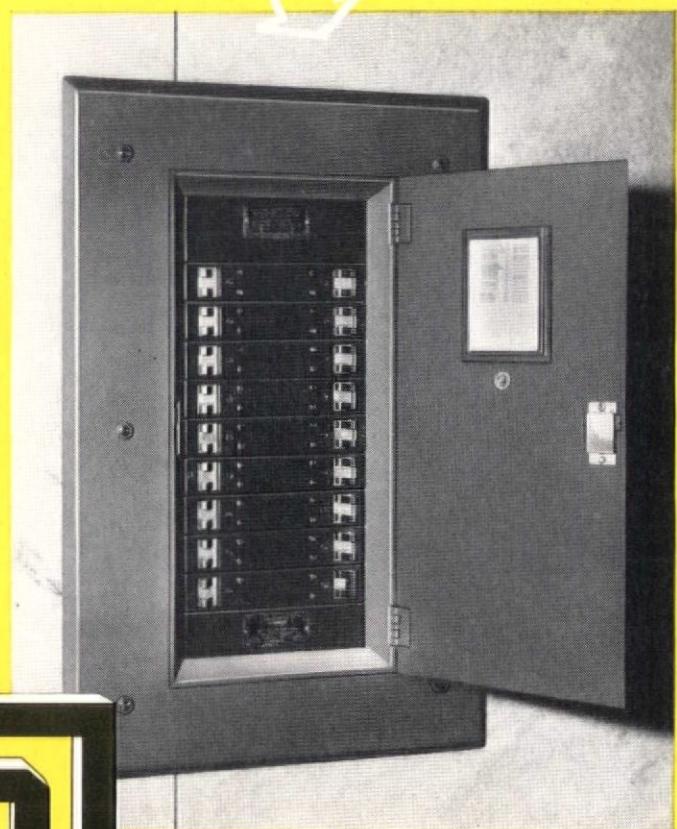
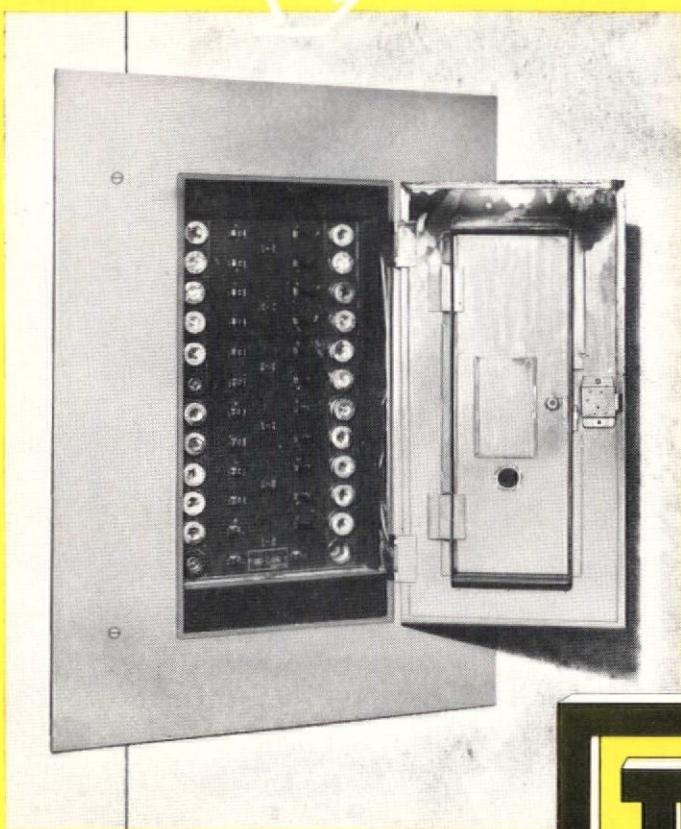
R. J. Haysor
PRESIDENT

REPUBLIC TONCAN IRON

An alloy of refined open-hearth iron, copper and molybdenum—that grows old slowly

Here was the Problem

Here is the Answer



HOW TO PROVIDE MORE CIRCUITS AND GREATER CAPACITY IN AN OVERLOADED WIRING SYSTEM

A Mid-western Public Utility Company was faced with a serious but not unusual lighting problem in its own office building. With the yearly increase in lighting requirements and electrically operated office machines, all circuits had become overloaded until there was an excessive voltage drop, reduction in light output of the lamps, and serious heating in the distribution panelboards. More circuit capacity and better lighting were essential, but it would have been very costly to rip out and replace the entire system.

By the use of the new thin wall wire, it was possible to increase the number of circuits in the existing conduit by about 50%. The problem of the distribution panelboards, however, still remained. Square D

THIS NEW MULTI-BREAKER PANEL, INSTALLED IN THE SAME BOX, PROVIDES 50% MORE CIRCUITS

Multi-breaker panels were the logical answer because 36 circuit Multi-breaker panels could be fitted into the old boxes which formerly contained 24 circuit fusible panels.

At small cost this company got the increased number of circuits so that the wiring system could be rearranged to permit the use of 500 and 750-watt lamps in place of 300-watt previously used.

There are many opportunities for such installations in which your clients may obtain as much as 50% more circuits and enjoy the many advantages of circuit breaker protection . . . at surprisingly low cost. Ask any good electrical contractor for details —or see the Square D catalog in Sweet's 23/11.

CALL IN A

SQUARE D COMPANY

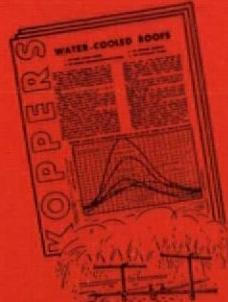
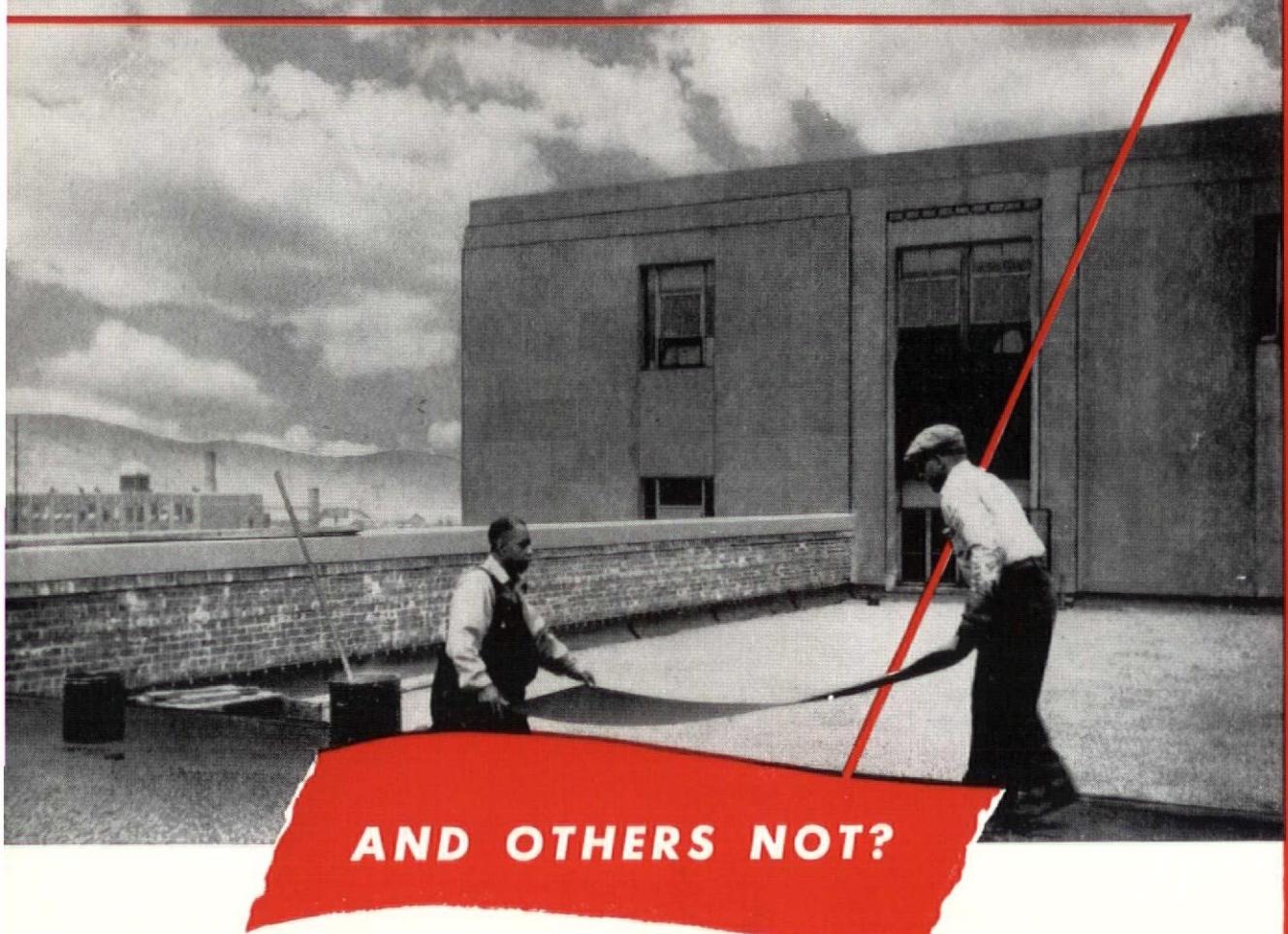
DETROIT - MILWAUKEE - LOS ANGELES

IN CANADA: SQUARE D COMPANY CANADA LIMITED, TORONTO, ONTARIO

SQUARE D MAN

Why do some roofs last 20 to 40 years . . .

FROM THE
KOPPERS LIBRARY OF
TECHNICAL INFORMATION



WHAT WATER-COOLED ROOFS DO
... AND HOW TO BUILD THEM



HOW TO PROTECT CONCRETE AND
MASONRY FROM WATER



HOW TO BUILD STEEP ROOFS
WITH COAL TAR PITCH



WHERE TO USE
PRESSURE-TREATED TIMBER

Why does one type of built-up roof last longer than practically all others? The reasons are pretty involved, but they all boil down to this simple fact: Coal tar pitch and tar-saturated felt are remarkably resistant to the disintegrating effects of sunlight and water.

But the important thing is not *why* one type of roof lasts so much better than others . . . but that it actually does.

No architect today has to judge between roofing materials on the basis of their physical

characteristics . . . he can decide between them on the basis of their record. He has before him the shining success of coal tar roofs during the last seventy or eighty years.

The past is the best guide to the future . . . and the past shows no other records for long life on built-up roofing comparable to those made by coal tar pitch.

With facts like that to guide you . . . with the same materials available today . . . your safest course is to stick to coal tar pitch.

KOPPERS COAL TAR PITCH ROOFING AND WATERPROOFING

KOPPERS COMPANY

TAR AND CHEMICAL DIVISION

PITTSBURGH, PA.

use K O P P E R S products

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| <input type="checkbox"/> "Water-cooled Roofs" | <input type="checkbox"/> "Tar-base Paints" |
| <input type="checkbox"/> "Roofing Specifications" | <input type="checkbox"/> "Pressure-treated Lumber on the Farm" |
| <input type="checkbox"/> "Membrane Waterproofing" | <input type="checkbox"/> "Creosote" |
| <input type="checkbox"/> "Dampproofing" | <input type="checkbox"/> "Creosote-Coal Tar Solutions" |
| <input type="checkbox"/> "Waterproofing and Gasproofing Sewage Plants" | <input type="checkbox"/> "Painting of Creosoted Wood" |
| | <input type="checkbox"/> "Where to Use Pressure-treated Lumber" |
| | <input type="checkbox"/> "How to Measure Pressure Treatment" |
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Title.....

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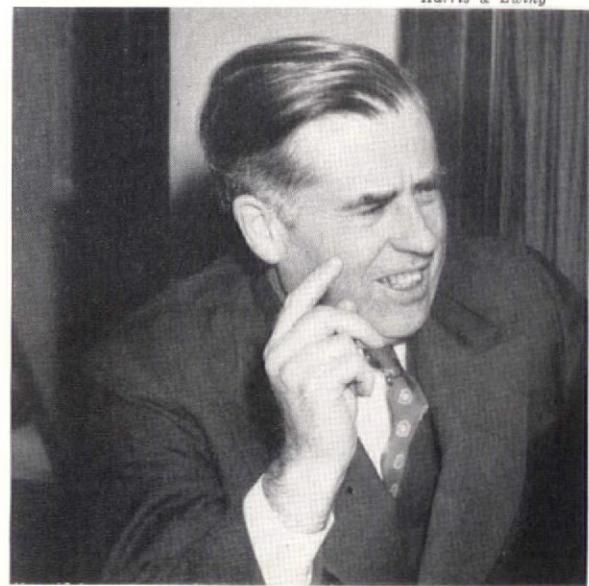
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and mail



HOW TO TEST DEPTH
OF PENETRATION IN
PRESSURE-TREATED TIMBER

THE ARCHITECTURAL FORUM JULY 1941

Harris & Ewing



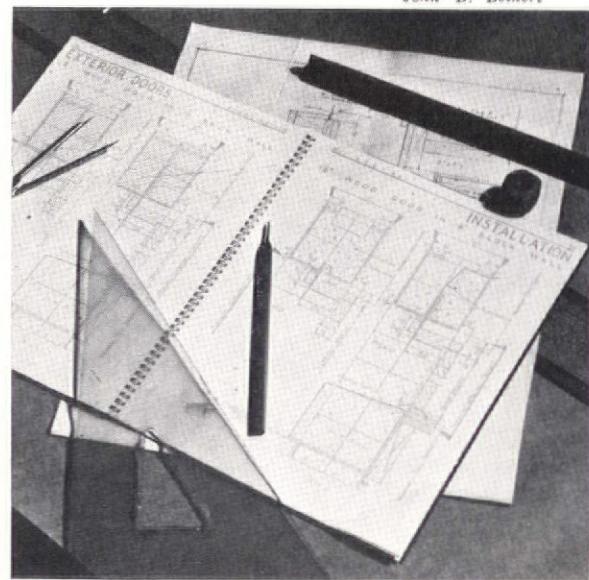
MAN OF THE MONTH . . . He points to Post-War Patterns (page 12)

Robert M. Damora



BUILDING OF THE MONTH . . . To Buffalo comes Orpheus (page 35)

John D. Beinert



PRACTICE OF THE MONTH . . . Four inches are more than a mite (page 31)

BUILDING FOR DEFENSE

PREFABRICATED STEEL WALLS

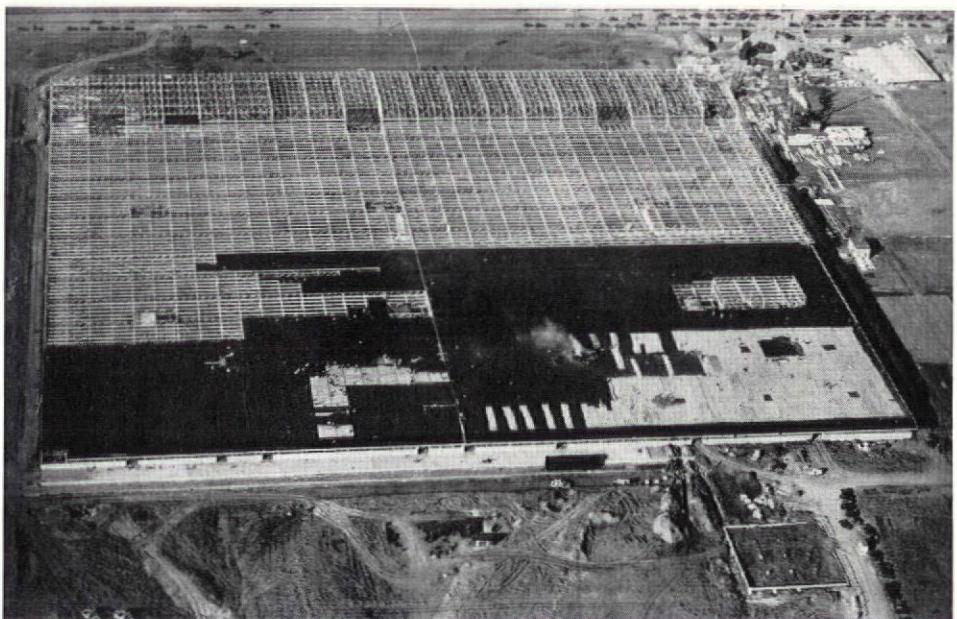
and roof for huge airplane plant.

Advantages: speedy four-month construction, bomb resistance, a perpetual blackout. North American Aviation draws 11,000 men to a Texas small town; Government houses 300 of them.

Many claims to fame has the new \$4 million plant of North American Aviation, Inc. completed last week in Grand Prairie, Texas. It is the first finished example of Government's strategic drive for industrial decentralization—North American's home plant is in far away Inglewood, California. It is the first entirely new aircraft factory to be completed under the defense program. Its main shop, containing 855,000 of the plant's 1,024,000 sq. ft., claims to be the largest industrial room in the world. It is windowless, air conditioned, artificially lighted with no less than 7,000 fluorescent fixtures and is thus perpetually blacked-out. It is undoubtedly the farthest advanced of all U.S. industrial projects as far as bomb-resistant design and construction are concerned. Most important, this complete airplane parts and assembly plant will soon roll ten military planes a day from its directional-flow production line.

Principles and progress. North American began building airplanes in 1935 when its California factory was only one-seventh its present 1 million sq. ft. size. To handle a backlog of defense orders now totaling some \$200 million, the company last fall was asked to build and operate the Texas factory for the Army. Fact that the first three advanced trainers from the new plant's production line zoomed over the heads of OPM Manager William S. Knudsen and gaping Texans at the plant's April 7 dedication—three weeks before their scheduled delivery to the Army—speaks well for North American's management and for Architects J. Lloyd Allen and John R. Kelley of Indianapolis, Consulting Engineer J. Gordon Trumbull of Cincinnati, Contractors James Stewart & Co. of New York and Subcontractors John Beasley of Muskogee, Okla. (steel erection) and George Freyn Brothers of Indianapolis (plumbing, air conditioning and electrical work).

After 21 days of plan and design preparation, the contract was let on November 13. Forthwith, scrapers removed the humus soil from the comparatively level cotton field, did what little grading was necessary. They were closely followed by cranes and "clamshells" which dug the foundation pedestal pits and, in turn, by the transit mix concrete trucks which poured the foundations, base walls and



ROOF CONSTRUCTION

floors. By December 2 the project was ready for the first of the steel framing members, many of which were assembled into trusses on the site and dragged through the mud to their respective locations. Despite 34 days and 14.2 inches of unseasonal rain, manufacturing operations began on March 8—only four months after the contract award. Final construction work on the last unit (administration building) was scheduled for completion last week.

During this construction period, North American operated a mechanics' training school in a nearby town, was therefore able to move 1,400 men into the shop by its dedication date. All machine tools will have been delivered by January 1942 and the payroll will then have been stepped up to a peak of 11,000.

Location and layout. For obvious reasons, every Texas city was anxious to have the new airplane industry move in. North American made two of them happy by selecting a 180-acre site in the small town (pop.: 1,595) of Grand Prairie only 12 miles from downtown Dallas, 22 miles from downtown Fort Worth. Advantages of the site: 1) It is next door to the Army's Hensley Field, 2) only three miles from a Dallas Power & Light Co. generating station and 3) just across an arterial highway

from the Texas & Pacific's main line. The railroad company ran a spur to the plant's unloading platform, and the contractor extended it temporarily to facilitate building material deliveries.

The site, however, was not without its disadvantages: 1) Lack of a public water supply required North American to drill two artesian wells, construct a 1 million gal. concrete reservoir; 2) Lack of nearby housing prompted Government to build within three-quarters of a mile of the site a 300-unit project containing complete community facilities—see page 5; 3) Lack of municipal sewage facilities necessitated the construction of a complete sewage disposal plant; 4) Lack of adequate transportation facilities—nearest Dallas bus stop is one mile away—may be alleviated by the petitioned extension of the line to the plant's front door on U.S. Highway No. 80.

Providing room for practically all the manufacturing processes under one huge roof, the main building measures 900 x 950 ft. To the east is a 150 x 300 ft. plane storage hangar to which one of Hensley Field's concrete runways has been extended. Also on this side of the shop is a 100 x 150 ft. drop hammer building and a 100 x 250 ft. foundry. To the south: a 100 ft. square paint storage building, a



FEDERAL HOUSING FOR NORTH AMERICAN WORKERS

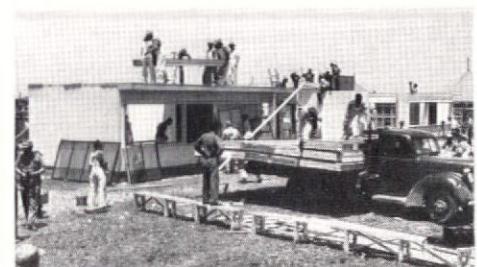
Long before the new North American Aviation plant (left) gets into full production, housing for many of its workers will be ready. On March 10 the Federal Works Agency awarded a contract for a 300-unit, \$750,000 project to Henry C. Beck's Central Contracting Co. of Dallas and Atlanta, specified that the last unit be complete in 100 working days. To meet this deadline, Contractor Beck set up an on-site prefabricating plant housed in three huge circus tents. Tent No. 1 serves as a storehouse for materials susceptible to weather damage. In Tent No. 2 the lumber is precut and moved to Tent No. 3 where it is assembled into wall, partition, floor and roof panels.

To demonstrate the speed with which the houses can be assembled and to attract public attention, Contractor Beck ran off a house construction race between two teams of 50 men each (including waterboys and substitutes), clocked the winning crew in 57 minutes and 58 seconds (see photographs, right).

More interesting than this show of speed is the design of the houses. Obviously adapted to Texas' hot weather, they are orientated to capitalize on the prevailing southwest breeze (see site plan, above) and are planned with large sliding doors and windows which facilitate cross ventilation. Also noteworthy is the fact, that while the houses are served by private cul-de-sacs they face each other rather than the street, the service wings of adjacent units being separated frequently by unique carports and outdoor storage rooms (see floor plans, above).

Architects: Roscoe P. DeWitt of Dallas, Richard J. Neutra and David R. Williams of Los Angeles. Development Engineer: Col. Lawrence Westbrook of FWA.

Within an hour after the panels had been trucked, from the huge prefabricating tents (left), the novel construction race was won, furniture had been moved in, a photographer's model was bathing in the tub, and a Fuller brush man was displaying his wares in the living room. (House below is built upon lower righthand floor plan shown above.)



William Langley Photos

BUILDING FOR DEFENSE . . . CONSTRUCTION EXPENDITURES PEAK

but the industry still has a mammoth market ahead. OPM's Statistician Newcomb plots the curve of presently scheduled Government building activity, hints at a sustained program of \$250 million a month. A look at the industry in its service uniform.

Now booming the country over, the U. S. rearmament program was touched off year ago last month when President Roosevelt appointed the seven-man Advisory Commission to the Council of National Defense. Up to the program's first birthday, Congress had authorized an expenditure of some \$42 billion to buy raw materials and pay for the six billion man-days of work necessary to convert them into defense articles. For its vital task of building the foundation for this defense program, the construction industry has been allocated some \$4.3 billion of the total, and at the birthday celebration last month the industry took the place of honor for having already reached the peak of its required defense effort, for having already accomplished about 60 per cent of its assignment. Today, \$2.5 billion of the \$4.3 billion of defense construction is on hand.

This official measurement of the construction industry's defense program comes from Economist Robinson Newcomb, one-time statistical tabs-keeper for NRA, who now holds his fingers on the pulses of defense industries as a researcher and statistician for the all-powerful Office of Production Management. To give the manu-

facturers of building materials and equipment an idea of the extent and trend of their defense market, Newcomb at a May meeting of the Producers' Council offered many a big round figure, held up several enlightening charts. In effect, his statistical study is a mirror in which the construction industry may see itself for the first time in a service uniform. Herewith a glance at the mirror:

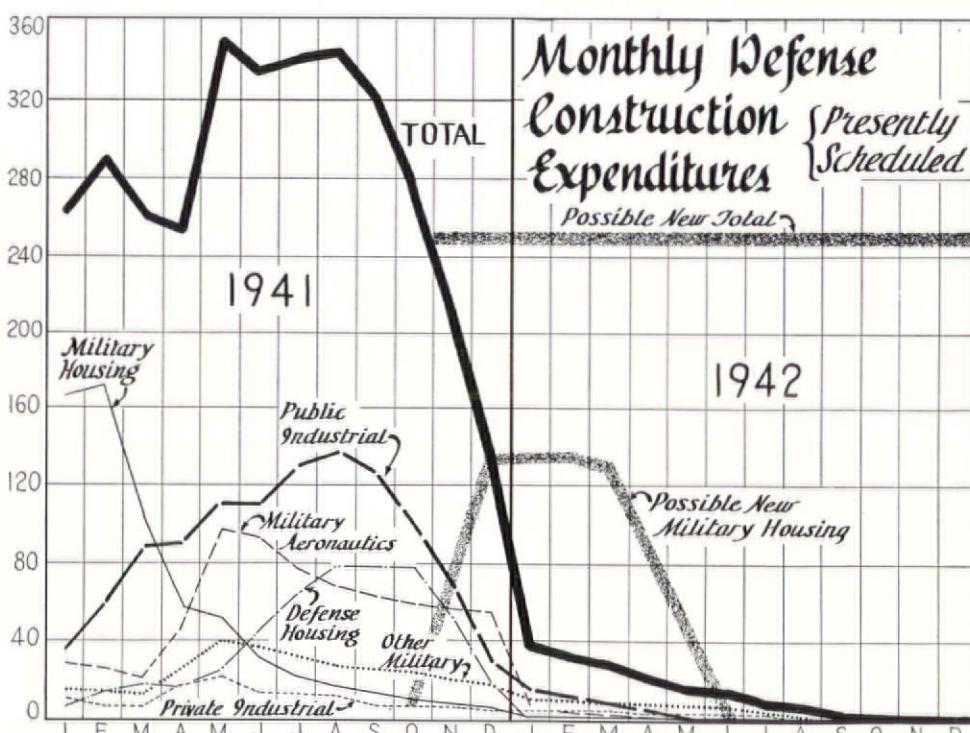
Military housing, including barracks, tent frames, hospitals and accessory buildings, is the most widely publicized of all types of defense construction and, incidentally, is the farthest advanced. The presently authorized program calls for an expenditure of a little less than \$1 billion, 90 per cent of which had already been spent by July 1. Practically all of this money has been dealt out by the Army's Quartermaster Corps for the construction of 45,000 buildings and 95,000 tent frames to house 1.2 million enlisted men in 185 different projects. At month's end, the Quartermaster Corps' military housing program was substantially complete—only \$13,205 was still "on order." (See progress tabulation, opposite.) Diminutive by comparison, the Air Corps' barracks

program in the hands of Army engineers and the Navy's barracks program have not moved as rapidly, will not be complete until the fall of 1942. Reason: due to the lack of equipment—airplanes and ships—necessary to the training of these two branches of the service, housing is not immediately demanded.

While the presently authorized cantonment program is complete, barracks builders may regret placing their tools in storage. It is no secret that the Army for some time has been contemplating another program of almost equal size (\$800 million), and it became a distinct probability with the President's recent declaration of an unlimited national emergency. Timing of this prospective program is of utmost importance for the entire industry due to the urgent demand for labor and materials (principally lumber) which it would entail. Comments Newcomb: "If this program is started in . . . July, it can make trouble for other defense construction projects, and it can cause considerable difficulty for private construction. If the barracks program can be postponed until October, it can be absorbed by the construction industry and can be used to help maintain the most efficient employment of men and equipment." (In October, the total present defense construction program is scheduled to begin its precipitous descent—see chart left.)

Aeronautics. Over and above military housing at air bases, construction of aeronautical facilities (hangars, runways, etc.) for the Army Air Corps and Navy will involve an expenditure of \$870 million, much of it for heavy engineering work. While the program was about 55 per cent complete at the end of June, construction activity will continue at a relatively steady rate until year-end.

Industrial facilities construction accounts for the biggest part of defense total—\$1.2 billion of public (U. S. and British Government) funds plus about \$245 million of private funds for plant expansion covered by Government-issued "Certificates of Necessity." Paced by the Quartermaster Corps' whopping \$532 million ordnance program, public defense industrial construction expenditures at the end of 1940 totaled \$200 million, jumped to \$588 million at 1941's half-way mark at which time a little less than half of the programmed work had been accomplished. The balance will be done in steadily decreasing amounts each month until September 1942. Setting a still better record, presently scheduled private industrial defense construction is more than 60 per cent complete.



This chart is based on a breakdown by months of the presently scheduled defense construction expenditures tabulated on the opposite page. Data through May 1941 are actual expenditures; subsequent data are official estimates of scheduled expenditures. Lower gray line represents the possible effect on the military housing curve of the \$800 million additional program now under official consideration. Upper gray line at the \$250 million per month level represents the possible total program if and when projected construction (not yet scheduled) is undertaken. This chart has been compiled by THE FORUM on the basis of its interpretation of data made available to it by OPM Statistician Robinson Newcomb.

While they cover all work currently authorized and scheduled, these industrial facility construction estimates will probably prove to be extremely conservative. Additional plant expansion programs under active consideration have prompted OPM Researcher Newcomb to hedge his estimates: "It is conceivable that by the end of 1942 total expenditures for industrial facilities may be even double those currently programmed."

Defense housing is the farthest behind of all defense construction categories even when consideration is given to the fact that \$150 million of the program's \$500 million total was appropriated less than three months ago. Thus, the value of work in place at the end of 1940 was only \$3 million and only \$126 million was added during 1940's first six months. In other words, the program today is but a shade more than 25 per cent complete. To catch up with industrial and military construction, Newcomb estimates (optimistically, perhaps) that Government defense housers will finish their \$500 million assignment by year-end. Peak month: August with a predicted \$79 million defense housing expenditure.

Total of four main defense construction categories discussed above plus a couple of minor classifications (see tabulation, right) comes to about \$4.2 billion of which \$2.5 billion, or 58 per cent, was in place a week ago. Biggest month for this total program was March when \$350 million went into construction. Barring anticipated increases in most every category, the presently programmed work will continue at a rate well above \$200 million a month until December, will then fall steadily until its completion in December 1942. "Including proposals (for additional programs) which we have reason to believe will be translated into contracts within a few months," comments OPM Researcher Newcomb, "the construction program exceeds \$5 billion, of which possibly \$4 billion may be translated into steel and stone within the current calendar year."

Scope of this publicly financed defense construction program is readily grasped when it is recalled that public construction expenditures of all types came to only \$2.6 billion in 1939.

Materials. While the Government-financed defense program assures the construction industry of an active future from the standpoint of demand, uncertainty as to the supply of materials for meeting the demand prompts Newcomb to hedge his hope "that the construction industry can proceed at a pace 40 per cent above that reached last year" with the warning that "particular shortages can and may make serious difficulties." He points out that Government construction agencies have already been asked by OPM to economize wherever possible in the use of aluminum, zinc and brass, and that similar instructions may go out later concerning the use of iron, steel and even lumber. Insulation

manufacturers have been asked to conserve cork, and voluntary priorities are already in effect on insulation board. Aimed at the industry as a whole rather than the building material and equipment manufacturers to whom he spoke was Robinson Newcomb's concluding admonition: "The

construction industry will do the defense program a real service if the individuals and companies in it will give serious study to the possibility of conserving materials for which shortages are developing and also give serious consideration to possibilities for developing substitutes."

DEFENSE CONSTRUCTION EXPENDITURES in thousands of dollars

Type of Construction	Total Scheduled Program	Value Placed During 1st Half 1941	Total Value in Place on July 1, 1941	Balance to be Expended
MILITARY HOUSING				
Army QMC—Barracks	741,339	489,131	729,042	12,297
Army QMC—Hospitals	20,174	14,010	19,266	908
Army Air Corps—Barracks	127,807	48,180	75,718	52,089
Navy—Barracks	36,251	11,546	25,822	10,429
Navy—Hospitals	14,257	6,338	8,577	5,680
Total	939,828	569,205	858,425	81,403
MILITARY AERONAUTICS				
Army Air Corps ²	493,109	152,243	176,769	316,340
Army Air Corps—Outside U. S.	69,084	19,131	34,081	35,003
Navy Aeronautic Facilities	308,160	151,994	254,211	53,949
Total	870,353	323,368	465,061	405,292
OTHER MILITARY				
Army QMC—Misc. ³	12,748	6,759	8,703	4,045
Army QMC—Outside U. S.	68,609	22,231	31,320	37,289
Navy Yards & Docks—Misc. ³	384,620	116,057	215,459	169,161
Total	465,977	145,047	255,482	210,495
Total Military	2,276,158	1,037,620	1,578,968	697,190
INDUSTRIAL—PUBLIC				
Interior Department	400	400	400	...
QMC—Ordnance Plants	531,544	224,342	272,142	259,402
Army Air Corps—Plants	46,779	24,454	31,512	15,267
Army Ordnance—Plants	26,014	13,598	17,523	8,491
Army Chemical Warfare—Plants	135	115	135	...
Navy Yards & Docks—Ordnance	27,036	13,349	16,700	10,336
Navy Bureau of Ships—Plants	110,930	57,987	74,725	36,205
Navy Bureau of Aero.—Plants	17,171	8,975	11,566	5,605
Navy Bureau of Ordnance—Plants	57,060	29,827	38,437	18,623
Defense Plant Corporation	133,390	69,770	89,897	43,493
Reconstruction Finance Corp.	10,199	5,331	6,870	3,529
U. S. Maritime Commission	16,341	8,542	11,008	5,333
Lend-Lease Program	250,000	17,500	17,500	232,500
Total	1,226,999	474,190	588,415	638,584
INDUSTRIAL—PRIVATE⁴	245,050	88,926	155,186	89,864
MISCELLANEOUS PROJECTS				
Defense Housing	500,000	126,000	129,000	371,000
British Purchasing Comm	14,356	5,474	6,802	7,554
TOTAL CONSTRUCTION	4,262,363	1,732,210	2,458,371	1,804,192

¹Does not include data for construction programs which have not yet been reduced to a scheduled basis. Figures are based on actual expenditures to May 1, 1941 and officially reported schedules for May and June 1941 (Schedules reported as of June 7, 1941.)

²Includes approximately \$37,000,000 scheduled but not yet allocated to specific projects.

³Primarily maintenance and storage facilities.

⁴Through certificates of necessity.

BUILDING FOR DEFENSE

... GOVERNMENT HOUSERS MEET

each week to study program progress, dodge bullets and bouquets from Boss Carmody who last month pulled in young blood to speed the work via private architects, prefabrication and good weather.

Each Wednesday the paneled auditorium of Washington's old Interior Building is alive with the men who run the Federal defense housing program. Something new in Government housing procedure, this meeting, instigated by Federal Works Administrator John M. Carmody, is the nearest thing to the much-talked but much-balked coordination of the many Government housing agencies, is therefore a highly significant powwow. Prodded by the tart, running comment of the Administrator, more than 100 housers here study the progress of each of the 278 individual projects graphically presented on huge spotlighted charts, take praise for work that is moving on schedule, take the rap and offer explanation when their boss uncovers delays.

Some at this weekly meeting are Washington oldsters, like Public Buildings Administration's Commissioner Winchester E. Reynolds, but many are new, like 30-year-old Clark Foreman, Carmody's alter ego. Most of the new ones are the personnel of a new housing body set up to specialize in defense construction, speed the lagging program, aim for a new 59 day pre-construction timetable which calls for completed designs and working drawings in 24 days.

Organized by Carmody as an integral part of FWA, the new Division of Defense Housing is directly responsible to him, but is directed by Foreman, one-time head of PWA's power division. Its formation is apparently a recognition of the theory (long advanced by outside observers) that efficient, speedy, defense housing construction involves special problems, needs new blood and a fresh viewpoint. It is also recognition of the fact the progress to date has been slow, that something should be done about it. If the new DDH solves the problems, and it is geared to do so, Carmody and his men will get the credit.

Directly responsible to Carmody, DDH Director Foreman has charge of all defense housing clearing through FWA—which, since the Navy program is complete, means all of it from now on. He also has charge of all direct construction by FWA itself, except that handled by Carmody's Special Assistant Col. Lawrence Westbrook, an independent one-man building agency. (See p. 5 and ARCH. FORUM, May 1940, p. 341; June 1940, p. 443.) Finally he is responsible for the proper management and eventual disposal of all FWA defense housing. Aiding Foreman in this colossal assignment is Assistant DDH Director Sherwood Reeder, former manager of the Farm Security Administration's "greenbelt" housing project near Milwaukee. Also aiding him is the subdivision of DDH into four sections.



Defense housing powwow in the auditorium of Washington's old Interior Department Building is interrupted by comment and query of Chairman John M. Carmody, FW Administrator seated in swivel chair. In first row (left to right), PBA Design Chief G. S. Underwood who studies spotlighted progress chart, PBA Records Keeper Harry Parlin, and A. V. Keene of FWA's Finance Division who thumbs through notes. Broad back is that of Records Keeper Ben Mills of FWA's Engineering Management Division whose pointer traces the development of projects on the chart. When it lands on a colored pin (dots on chart shown to right), which means trouble, Chairman Carmody calls on the job chief for reasons, guides him if necessary, chides him if the excuse is flimsy.

Prefabricated housing section under the guidance of Rufe F. Newman, past regional PWA director, and Allan W. Stevens, prefabrication's only friend in PBA, will supervise the development of all projects comprised of prefabricated houses—both demountable and "permanent." It will meet with prefabricators, determine their abilities, let contracts, select local architects and supervise house erection.

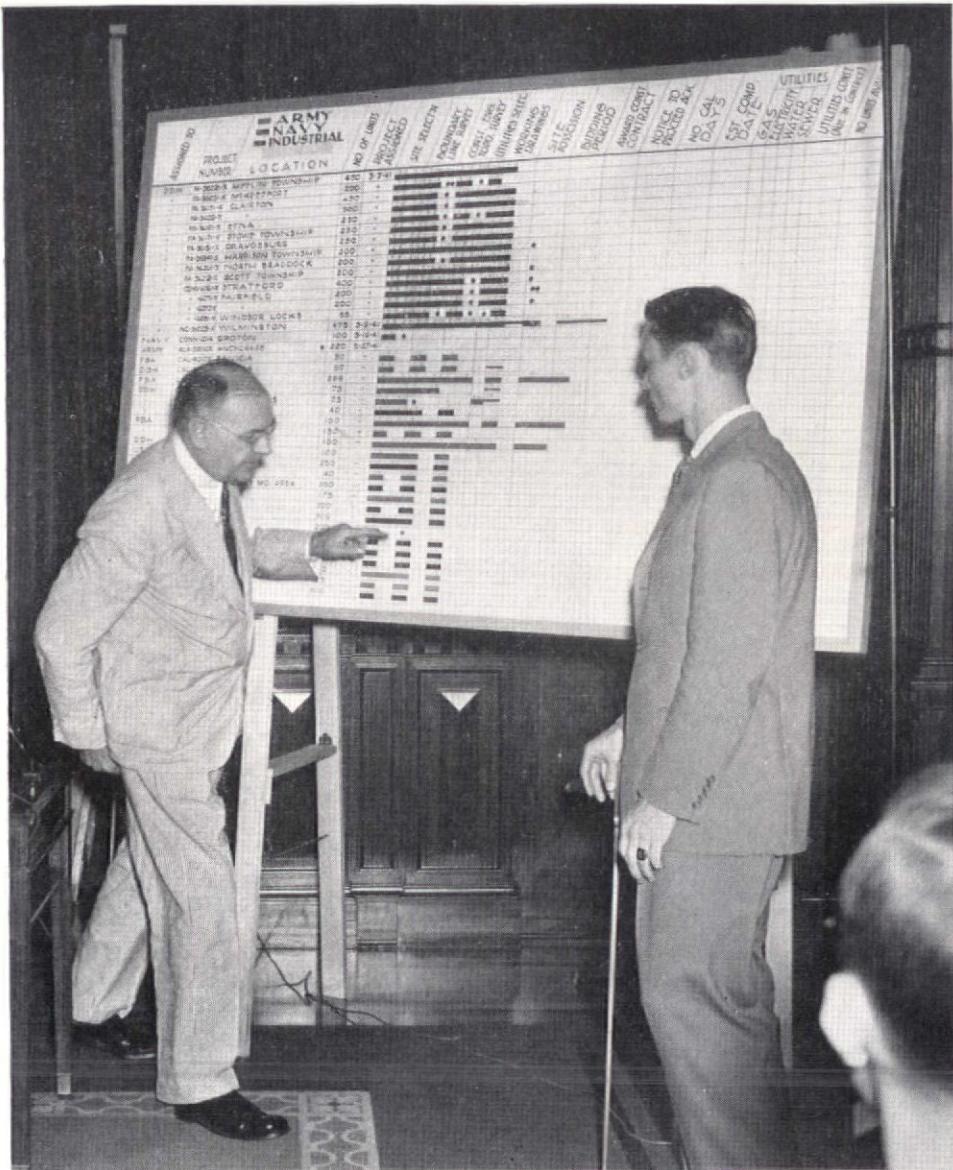
Under the direction of this Section, a new and long awaited policy will be initiated whereby qualified prefabricators will immediately receive large production orders through which a sizable backlog of prefabricated parts will be created.

Special operations section, headed by Talbot Wegg who came from USHA, will take charge of the scheduling and production of all DDH housing except that under the jurisdiction of the Col. Westbrook and the prefabrication experts. Biggest job to date is the development of fourteen projects comprising some 5,000 dwelling units in the vicinity of Pittsburgh; next biggest, eleven projects comprising 2,215 units in Connecticut. These two jobs were deemed too big for either PBA or USHA, will be handled by DDH field offices set up in the respective areas to work in close cooperation with local housing authorities. Noteworthy and encouraging is the fact that projects prosecuted by this Section, which may eventually rival PBA in importance,

are all to be designed by private architects selected by direct local negotiations and paid on a fixed fee basis.

Construction review section, headed by Architect Kline Fulmer, erstwhile resident manager of FSA's Maryland "greenbelt" project, will maintain a strict watch over defense housing construction by all Government agencies spending FWA's defense housing dollars—FWA, PBA, USHA, FSA, TVA and the Navy. It will also advise Carmody on architectural, engineering and construction problems and on the use of materials.

Management section is under the guidance of DDH's Assistant Director Sherwood Reeder, aided by James W. Bradner who formerly ran TVA's town of Norris. In their hands falls a pair of knotty problems: the management of all defense housing projects for the duration and then the disposal of these projects with a minimum loss to the Government and a minimum disturbance to local real estate markets. Project rents will not be fixed but will be graded in line with the earning power of the occupants. Enlisted men will be required to fork over their shelter allowance which varies in accordance with their rank and number of dependents. Defense industrial workers and civilian employees of the Army and Navy will be charged about 20 per cent of their monthly incomes plus the cost of utility services.



PBA'S Commissioner W. E. Reynolds, left, and Supervising Engineer Neal A. Melich, PBA, once kingpin agency in defense housing, will henceforth play a decreasingly important part in the program.

Red as a fever blotch are the little round pins which show that a project has bogged down — in this case at the boundary line survey stage. FWA Administrator Carmody points a finger at the trouble, demands an explanation while Records Keeper Ben Mills stands aside. Complains Carmody: "There are rotten land records in most county court houses . . . not a single piece of property is properly described in any of them."



Housing oldsters seated around table (left to right) are Assistant USH Administrator William P. Seaver, Charles W. Short, representing Col. Lawrence Westbrook, and Col. Walter L. Simpson, director of USHA defense housing. The weekly powwow is an informal meeting of about 100 Federal housing experts who smoke, slump in their chairs, but pay sharp attention. Carmody opened the meeting with the statement that "we are here to talk about the bad things that happen not the good things."



Housing youngsters on the other side of the table are Director Clark Foreman of the FWA's new Division of Defense Housing, (in white suit), Morris Miller, an assistant (smoking cigarette) and other young members of Foreman's staff. Shortly after this picture was taken, Foreman took Carmody's chair when the Administrator left the meeting. His parting words: "Every day we delay the paper work we are losing some finest construction weather of the year. We must take advantage of all the breaks the weather gives us."

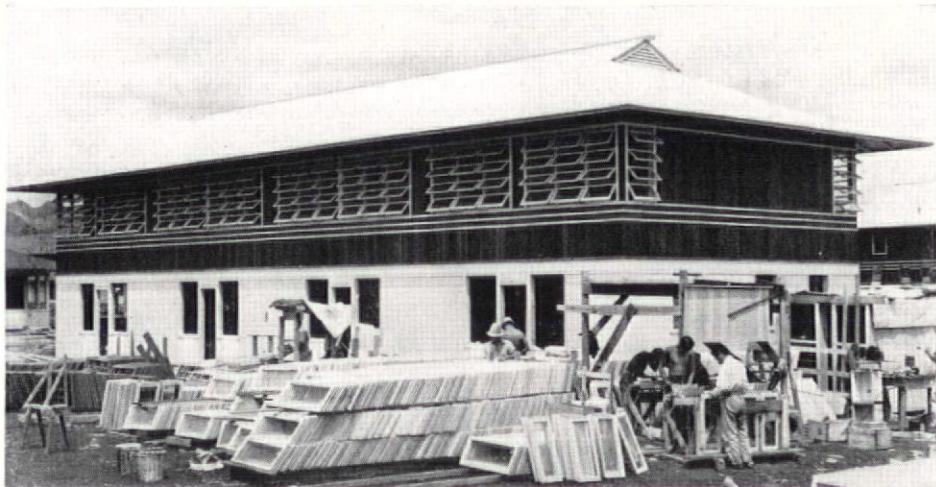
BUILDING FOR DEFENSE . . . A LOOK AT FEDERAL HOUSING

shows that PBA designs are not the best and, in some cases, not the worst. Houses in Hawaii most interesting of 1,100 completed to date.



PBA Photo

Oahu Island, Hawaii. Among PBA's most attractive defense houses are these which will serve 550 families of enlisted personnel at the Army's Hickam Field. Comprised of 410 four-room units and 140 five-room units in 250 separate buildings, the project is being built by Contractor E. E. Black Ltd. of Honolulu at an estimated cost of \$1,717,000 plus a fixed fee of \$82,000. Average cost is about \$3,300 per dwelling unit, exclusive of expenses for administration, land acquisition, public utilities and community facilities. Roof design is admirably adapted to Hawaii's hot sun; abundant window areas aid ventilation. Maximum permissible cost in U. S. territories is \$4,750 per unit, but the program average for territorial defense housing may not exceed \$4,000. Continental maxima: \$3,950 and \$3,000, respectively, the latter recently raised to \$3,500.

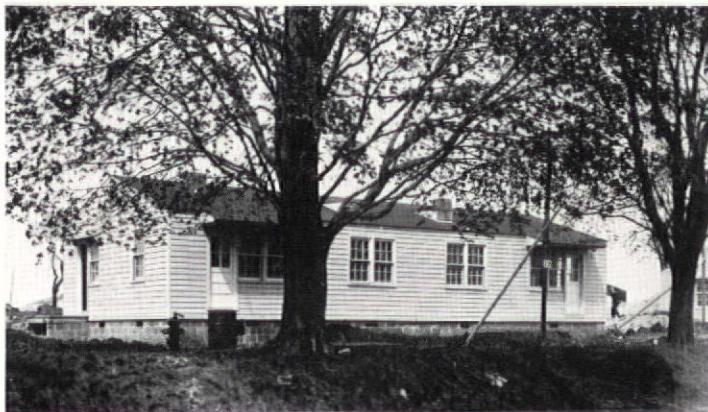


Columbus, Ga. This white-painted brick building contains two of the 350 dwelling units being built near the Army's Fort Benning at a cost of \$1,035,000 plus a fee of \$47,000 to local Contractor Murphy Pond. Average cost: about \$3,100 per dwelling unit. Construction began on January 17.

Once a specialist in post office construction, the Public Buildings Administration has recently become the biggest designer and producer of houses in all U. S. history. Since the launching of the Federal defense housing program last August, it has been assigned 30,500 dwelling units in 135 projects coast to coast. At mid-June, 22,500 units were under construction, and 1,100 units in 13 projects were complete. Herewith a look at completed houses in seven projects. Chosen at random, they represent PBA's best design work, but not its worst.

All PBA housing is designed by its own staff of Federal architects and draftsmen without the assistance of local private professionals—a fact all too apparent in some of PBA's projects, such as Benicia, Calif. (right above) and San Antonio, Tex. (right below), whose houses might easily be mistaken for chicken barns. It is unfortunate that PBA's designers have not given to more of their continental housing projects the same light, ventilation and function study which obviously preceded the attractively sensible design of its Hawaiian project (left).

Some of PBA's design shortcomings are explained by its inexperience in the specialized field of low cost housing and its unrewarded, however sincere, efforts toward speed—the record of 1,100 units completed in ten months is no great shakes. For these and other obvious reasons, Building took heart last month when Administrator John M. Carmody of PBA's parent, the Federal Works Agency, created a new defense housing subsidiary, staffed it with recognized experts, announced that private local architects would at long last be invited to design the housing, indicated that this "Division of Defense Housing" might soon outrank PBA as the biggest Government frog in the defense housing pond. (See p. 8.)



Hempstead, N. Y. A similar two-family building of frame construction, this building is one of 64 going up on Long Island for use by married enlisted personnel stationed at the Army's Mitchell Field. The 200 unit project will cost \$717,000 plus a fee of \$32,500, or about \$3,750 per unit. Contractor: H.R.H. Construction Corp. of New York City.



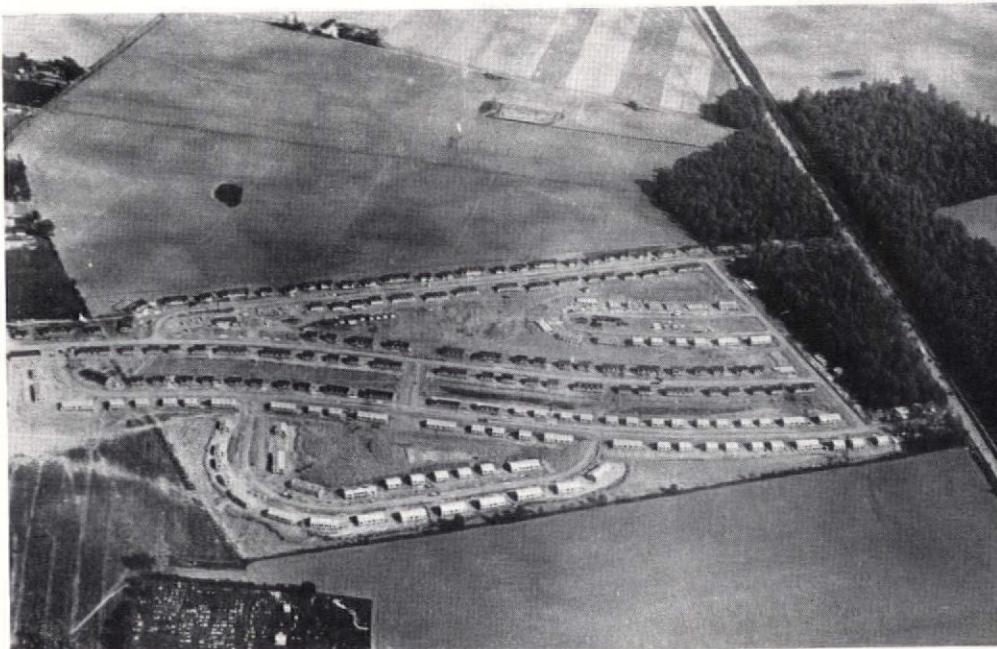
Benicia, Calif. This one-family house serving a nearby Army arsenal looks better when viewed from a distance along with its 49 neighboring units (right). The project has been prefabricated by Contractor Fred J. Early Jr. Co. of San Francisco at an estimated cost of \$172,000 plus \$8,800 fee. Unit cost: about \$3,600.



Tampa, Fla. This concrete block building contains two dwelling units, is part of the 300-unit project shown to the right. Cost: \$816,000 plus a \$40,000 fee for local Contractor Paul Smith Construction Co. Unit cost: about \$2,850. Note improvement in appearance of these low cost shed-roofed houses over their pitched-roof counterparts above and below. Of course, the selection of a well-wooded site improves the appearance of the project considerably.



San Antonio, Tex. One of 300 units to cost \$814,000 plus a \$38,000 fee for local Contractor McKensie Construction Co. Unit cost: about \$2,800. Wire mesh is stretched between the concrete piers.



Aberdeen, Md. Airview of the 62-acre site on which 300 dwelling units in 212 detached buildings have been built for the families of civilian employees at the Aberdeen Proving Ground. Cost: \$1,007,000 plus a \$46,000 fee for Newark, N. J. Contractor Monahan-McCann Construction Co. Average unit cost: about \$3,500. Platting is somewhat informal, leaves ample space for public parks. Lack of trees reduced costs, attractiveness and camouflage.

BUILDING FOR DEFENSE . . . HEADWAY AND HEADACHES

Briefs from the Building-for-Defense news of the month:

► In Washington's Mayflower Hotel at mid-June a host of housing experts and students listened to other experts conduct a "National Housing Inventory" under the auspices of the National Committee on the Housing Emergency. They red-penciled these comments as most significant:

1. "The better the job our housing agencies do now in cooperating in behalf of the defense program, the greater will be their opportunities to do the socially right kind of housing job for the nation in the post-defense period." This piece of advice was added to the projected post-war pattern not by U. S. Housing Authority Administrator Nathan Straus, not by Director Coleman Woodbury of the National Association of Housing Officials, not by any other professional houser, but surprisingly by Hon. Henry A. Wallace, Vice President of the U. S. An erstwhile building and loan association director and, as Secretary of Agriculture, an amateur houser who has worked with Farm Security Administration "engineers in cutting the cost of building (their) houses in two," the Vice President continued, "I, therefore, trust that the National Committee on the Housing Emergency will direct its effort toward promoting cooperation, not merely to get defense housing built with all possible speed, but also to consider the way in which housing can be used to help break the economic shock of peace. I am one of those who believe that peace can be made to mean more and better housing, more and better food, less unemployment and more security for old age. There are forward-looking businessmen in both the U. S. and England who realize more than ever before that the test of democracy is whether or not it can provide good food, decent shelter and security."

2. Stewart McDonald, one-time FHAdministrator, now Deputy Federal Loan Administrator, took the stump for much belittled private defense housing: "These 12 months following the set-up of the Defense Commission . . . will account for the

construction of approximately 500,000 single family homes, which is a high record for this country . . . Over 80 per cent, or more than 400,000 of them, have been constructed entirely by private capital . . . It is very plain that there is no shrinking of private capital in the home building division of the defense program."

3. Defense Housing Coordinator Charles F. Palmer of the OPM talked of problems and priorities: "We have met only one major obstacle . . . the unwillingness of a good many of those concerned with housing to cease trying to put a razor edge on the little private hatchet with which they have been hacking away on their own little patches of woods and to help to do their share to grind Uncle Sam's big ax . . . Some folks say 50 per cent of Nazi production is for war . . . And those same folks say we must bring ours up (from 15 per cent) to 50 per cent. The result is self-evident! Curtailment of all non-essentials; luxuries; frills; yes, even many kinds of building . . . Certainly it is better to have fifteen \$3,000 homes for defense workers when and where needed than one \$45,000 home, desirable though such a home may be for one who can afford it under normal circumstances. No shortage of lumber now exists to any great degree, although in certain areas there has been an apparent shortage because water transportation, which was formerly used extensively, is not now so generally available, and strikes have interfered . . . Here you see a portent . . . Our transportation problem may assume alarming proportions before long . . . We must plan as fair and easy a system of priorities as possible but we must see that essential defense housing gets material next in line after bombers . . . It may even be necessary to make a tight and narrow definition of defense housing and restrict other building. We hope such drastic measures won't be required."

Thus, Building heard the clearest-cut description yet offered on the cloudy subject of impending priorities, but still did not know where it stood.

► Rear Admiral Ben Moreell of the Navy's Bureau of Yards and Docks announced that \$5 million has already been spent in the construction of the Atlantic bases acquired from Britain, that with the exception of the Bahamas where site selection was delayed, all the bases were now ready for limited operations, that all would be complete within a year.

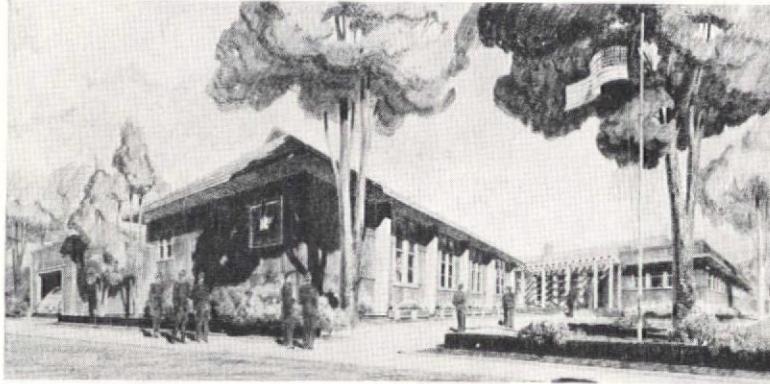
► "In the interest of security," Navy Secretary Knox ordered discontinuance of announcement of all contracts entered into by the Navy and individual contractors.

► At May's end the President established within the Office of Production Management the Office of Civilian Defense, named New York City's militant Mayor LaGuardia as director. To muster men, women and children in a voluntary mobilization for civilian protection, the OCD will be organized in three divisions: 1) Public Safety Division—to deal with fire protection and training for health and hospital work "insofar as needed in the event of attack." 2) Engineering Division—to train volunteers in street clearance and the repair of public utility lines. 3) Shelter and Food Supplies Division—covering welfare, evacuation, housing and food problems. With regional headquarters in each of the nine Army corps areas, the OCD field staff will be 80 per cent volunteers, will concern itself first with the civilian defense of coastal cities and industrial areas near seaports. A logical choice for OCD's directory, defense-conscious LaGuardia has for three years been preparing New York City for the worst (see adv. p. 4).

► Congress approved legislation upping the lending power of the Reconstruction Finance Corp. by \$1.5 billion, authorized RFC to use \$200 million of the fund for the purchase, lease, construction and expansion of defense industrial plants.

► President Roosevelt signed the Mandatory Priorities Act giving Government legal authority to subordinate civilian needs to defense requirements. Forthwith, OPM Priorities Director Stettinius added copper,

(Continued on page 42)



Standardized club house for spare-time use by men in the armed forces. New York City Architects Ely Jacques Kahn and Robert Allan Jacobs designed two buildings for duplication by the United Service Organizations near some 350 military, naval and defense industrial



establishments. Rendered above is the design to be used first (at Fort Dix, N. J.) and, probably, more often. To finance the nation-wide project, USO last month launched a \$10.8 million fund-raising campaign by dive-bombing New York City with promotional leaflets—see p. 42.

RECENT WORK BY EDWARD D. STONE

"We have been extremely fortunate in having clients who have had very definite ideas about architecture and living. These houses are the result of hard work on their part as well as ours and they have followed closely the development of the plans down to the smallest detail. The final results represent the ideas formulated by the owners, which accounts for the difference in character of the individual houses.

"The European influence in our earlier houses should be clear enough to anyone. If this influence has tended to diminish in later work, it has not been from a lessened appreciation of the contributions made by architects on the Continent, but to a growing appreciation of the rich field for development that exists in our own country, and to a conviction that American architecture, whatever its debt to others, must find its own solutions in its own way.

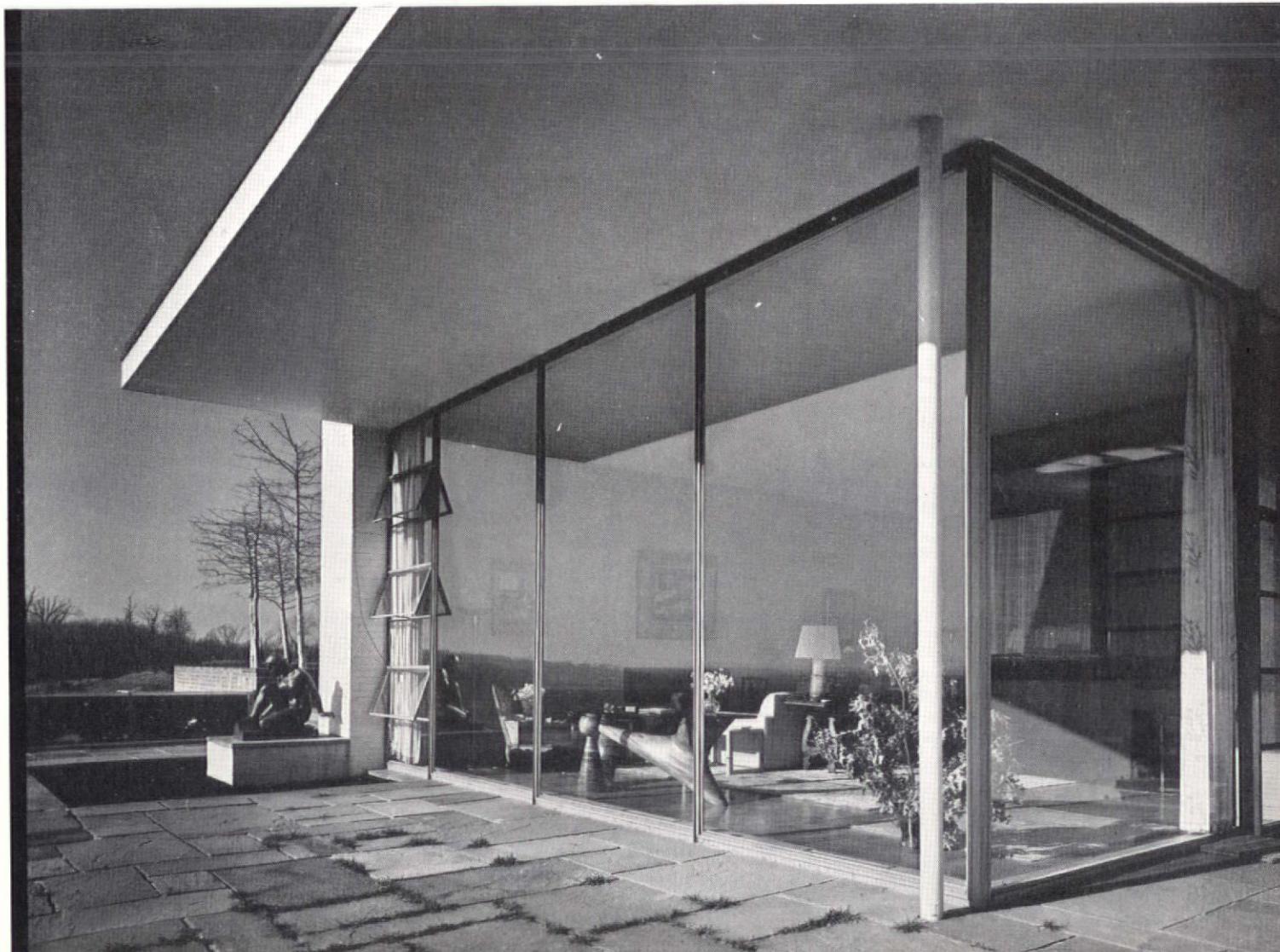
"I welcome this opportunity to speak of Robert MacKinnon, Jr. and Stanley Sharp of our office, who have contributed materially to the design and development of these buildings."

Martin Harris

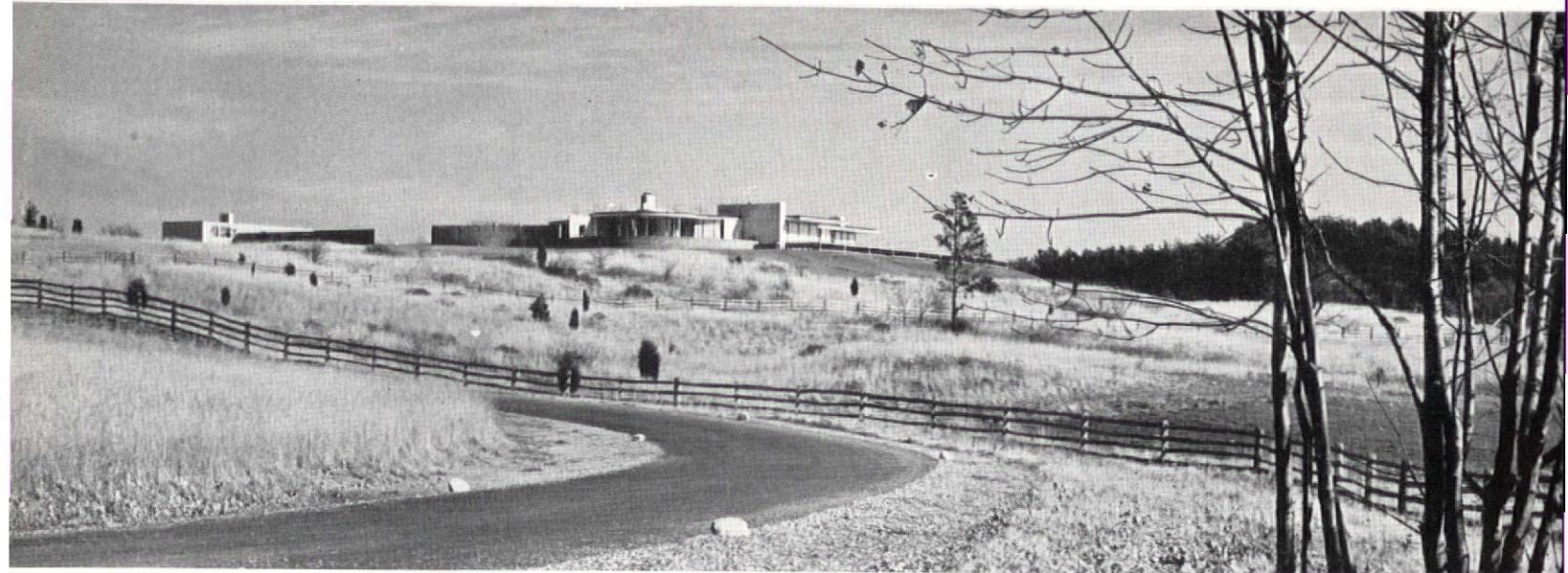


HOUSE FOR A. CONGER GOODYEAR, OLD WESTBURY, L.I., N.Y.

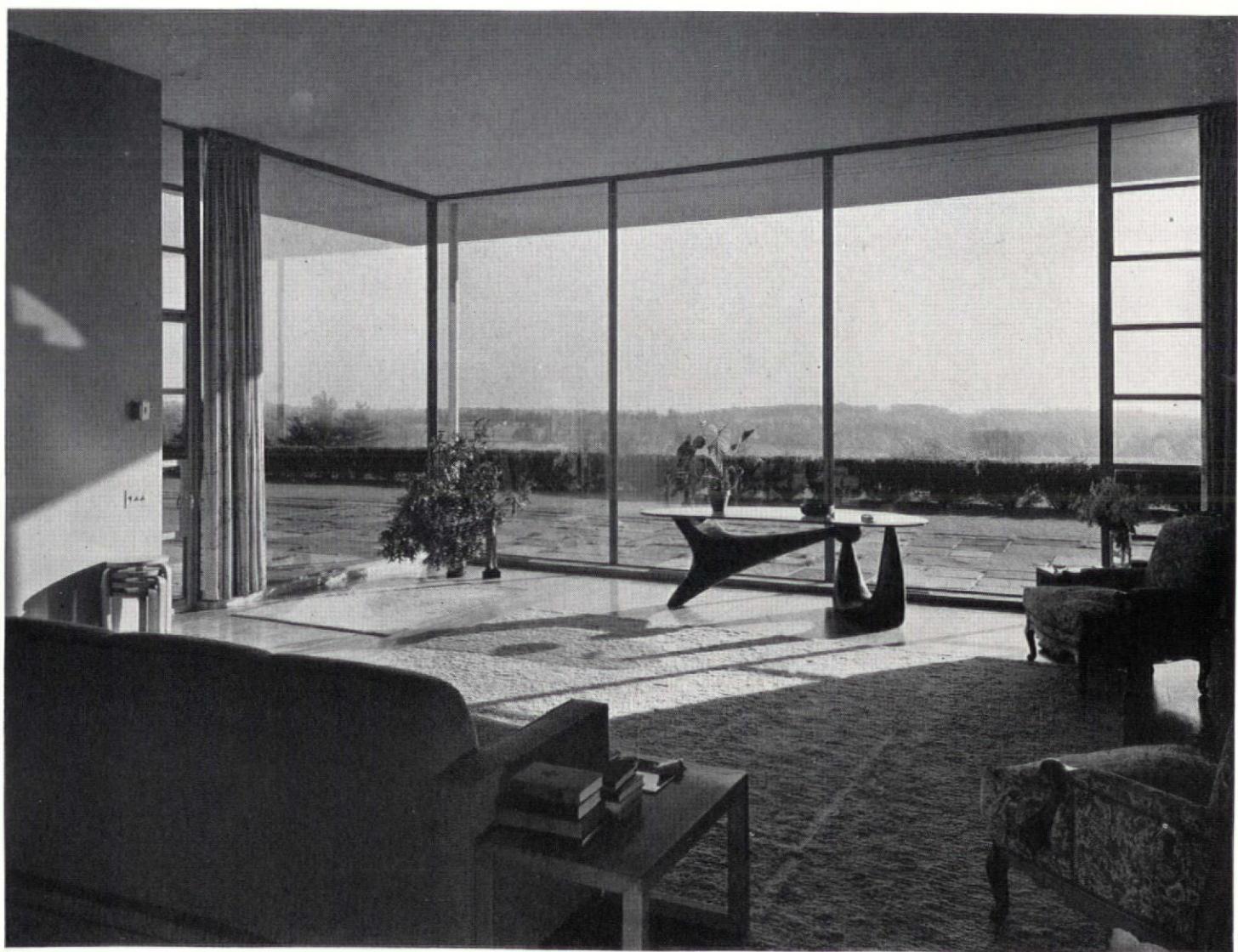
Ezra Stoller Photos



HOUSE FOR A. CONGER GOODYEAR, OLD WESTBURY, L. I., N. Y.



LIVING ROOM

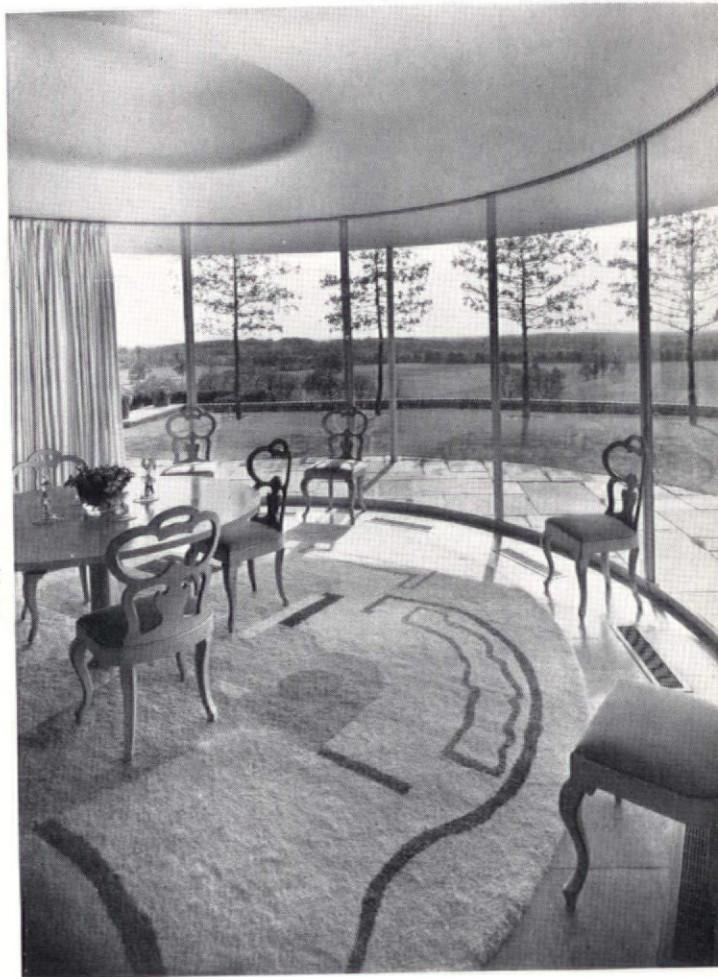
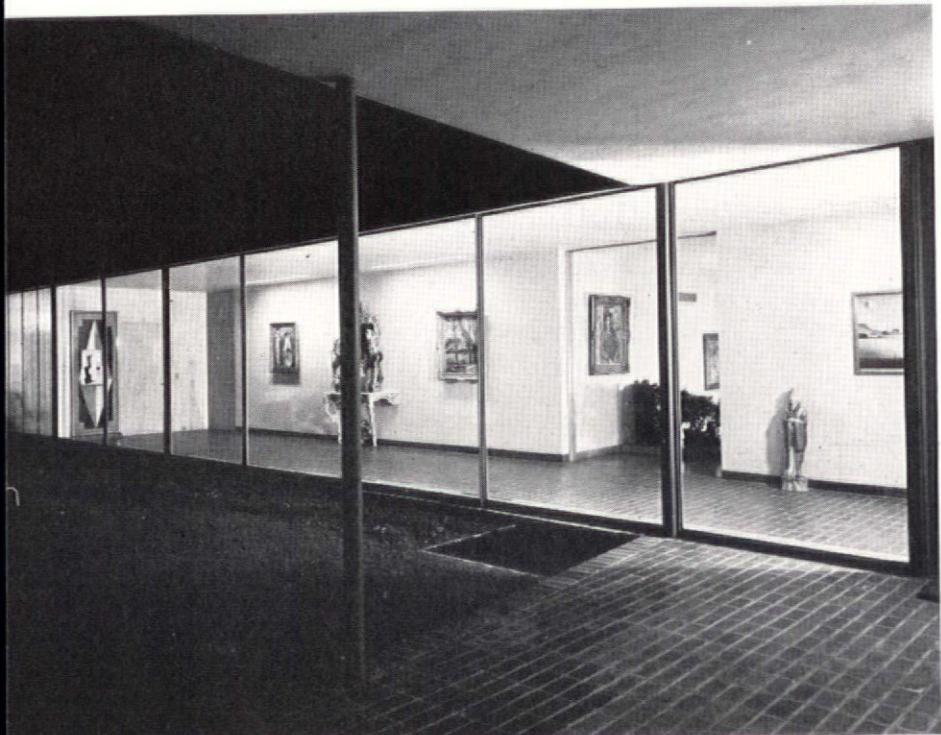


EDWARD D. STONE, ARCHITECT



1. SERVANT'S ROOM 2. KITCHEN 3. PANTRY 4. DINING ROOM
5. STUDY 6. LIVING ROOM 7. GUEST ROOM 8. BEDROOM
9. DRESSING ROOM 10. GALLERY.

GALLERY



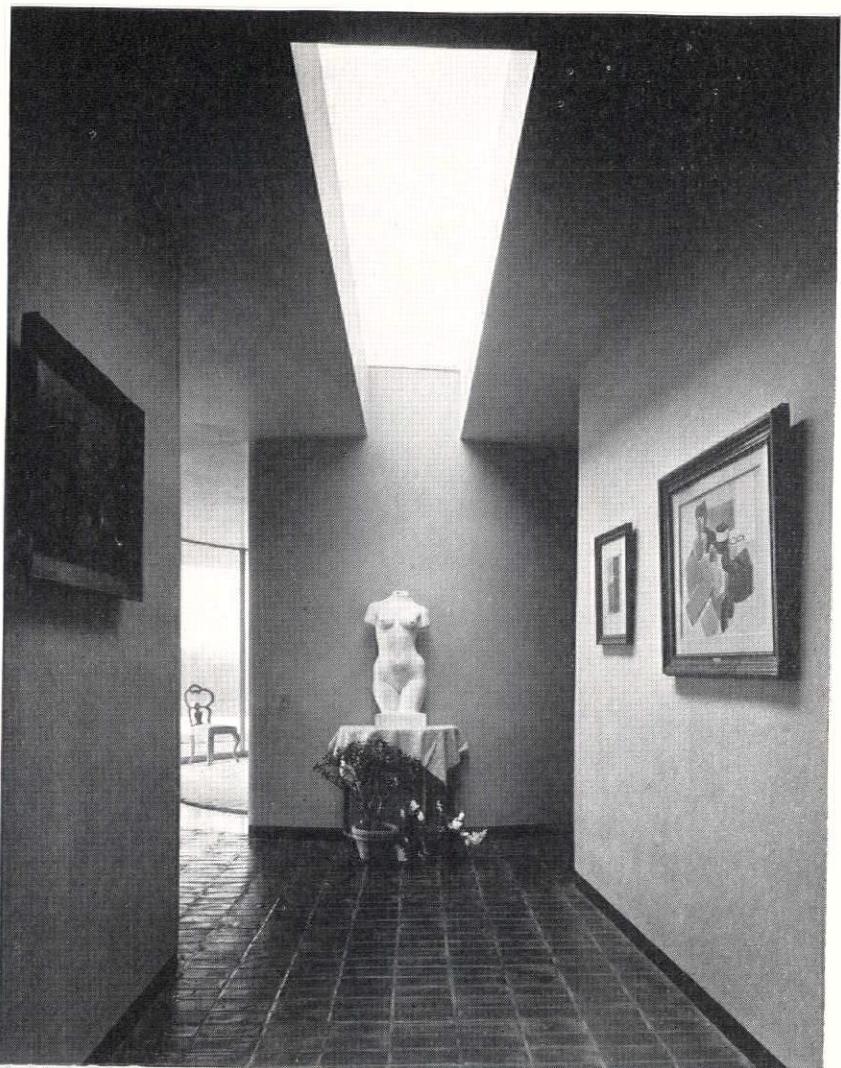
DINING ROOM

The work of Edward D. Stone is distinguished by an almost perfect balance between conscious discipline and free expression — a balance in which each factor is developed as fully as possible but never at the expense of the other. Thus in this example, the overall, governing concept is that of a structure consisting of two simple planes—the floor and ceiling—between which the enclosing walls and supports are an almost imperceptible incident. Such a concept presents technical difficulties which might be made an excuse for mechanical dominance of the structure; instead, it has been applied with remarkable consistency to a plan which has the easy, casual quality often achieved in a first rough sketch but regrettably absent in most completed buildings.

A unique and thoroughly thought-out solution of the problem of the single-story house, the design warrants careful study in all of its aspects and each of its expertly handled details. The most obvious thing which can be said about it is that it has been built around a terrace swimming pool, but the scheme would still be excellent even if this feature had not been included. A projecting wing, to the right of the entrance, houses the servant's room, kitchen, pantry, and guests' powder

room and lavatories, leaving the main living area free and exposed on three sides. Here the rooms are treated as distinct units, rather than merging parts of an "open" plan, but connected by a generous, well-lighted hallway used as a gallery for the display of paintings. Obviously planned with an eye to the necessities of formal entertainment, the circular dining room, the secluded library, and the separation of the living room from the balance of the house are a welcome relief from the stereotyped arrangement which insists that in order to be modern, the interior of a house must be as open as a barn.

The ceiling and the flush soffit of the overhanging roof extend at a uniform level over the entire area of the plan, uninterrupted by beams or projections of any kind. Extra height for the living room, and division between it and the bedroom wing, is accomplished by placing the living room floor several steps below that of the balance of the house, and by a narrow strip of terrace outside the floor-to-ceiling windows of the bedrooms. Among the many excellent details, the disposition of fixed glass and movable sash is especially successful, while the provision of overhead light in the dining room end of the gallery (right) makes a distinctive feature of what might otherwise have become a dark little pocket in the plan.



GALLERY

TERRACE AND POOL

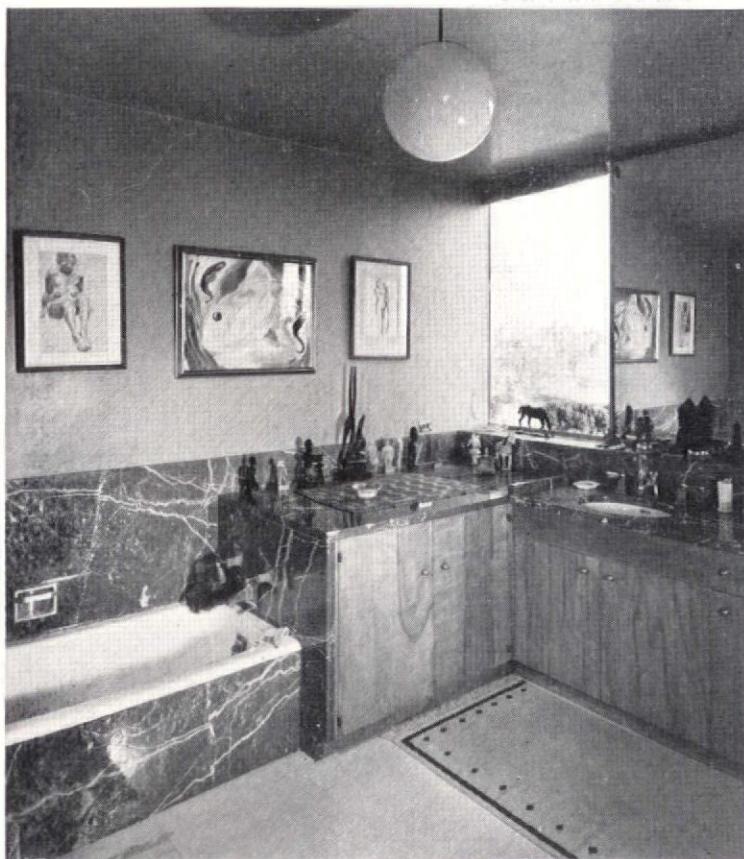




BED ROOM



BATHROOMS



CONSTRUCTION OUTLINE

FOUNDATION: Reinforced concrete and concrete block. Waterproofing—membrane.

STRUCTURE: Exterior walls—8 in. load bearing brick, wood furring, metal lath and plaster; inside—wood studs. Floor construction—concrete slab over basement; wood over unexcavated areas.

ROOF: Covered with 5-ply slag surface, The Barrett Co. **FIREPLACE:** Damper—H. W. Covert Co.

SHEET METAL WORK: Flashing—16 oz. copper.

INSULATION: Roof—4 in. mineral wool, Vaporseal, Celotex Corp.

WINDOWS: Sash—projected steel, Croft Steel Windows, Inc. Glass—plate, Pittsburgh Plate Glass Co.

FLOOR COVERINGS: Living room—teak plank; bedrooms—oak block, both by John Hasbrouck. Halls—common brick. Kitchen and bathrooms—resilient tile, Kompolite Co.

WOODWORK: Cabinets—teak and oak. Interior doors—Roddis Lumber & Veneer Co. Exterior doors—Croft Steel Windows, Inc. Garage doors—Kinnear Mfg. Co.

HARDWARE: By American Hardware Corp.

PAINTS: Exterior—Roccor Art Stone Co.

ELECTRICAL INSTALLATION: Wiring system — BX. Fixtures—T. S. Kelley.

KITCHEN EQUIPMENT: Refrigerator—General Electric Co. Cabinets—Steeline Kitchens Co.

BATHROOM EQUIPMENT: By American Radiator—Standard Sanitary Corp. Cabinets—G. W. Ketcham Co.

PLUMBING: Hot and cold water pipes—copper, Chase Brass & Copper Co.

HEATING: Forced warm air system, Claridge Fan Co. Boiler—H. B. Smith, Inc. Oil burner—Petroleum Heat & Power Corp. Radiators—American Radiator—Standard Sanitary Corp. Grilles—Tuttle & Bailey, Inc. Regulator—Minneapolis-Honeywell Regulator Co.

MURPHY BROTHERS & BRINKWORTH, BUILDERS

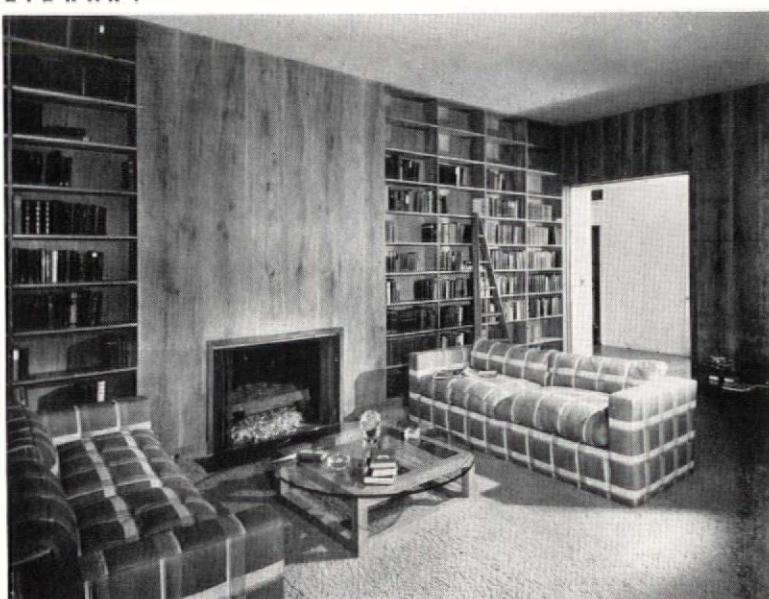
Used as a daytime retreat by a busy city executive and an office for his nearby private press, this unusual little building takes full advantage of a charming setting. The principal features of the design are excellent—the sliding doors in the side of the library, the partly sheltered, partly open terrace on the second floor, and the glazing of stairwell are handled in the crisp Stone manner with his usual success—but the use of a plan in which the library is telescoped into the two-story portion of the building creates problems in massing which have not been as successfully solved. This conflict is accentuated by the fact that the treatment of the projecting portion seems heavier than that of the main portion, resulting in a feeling that either element would be better by itself than in combination with the other.

CONSTRUCTION OUTLINE

STRUCTURE: Solid brick walls; inside—wood studs and plaster.
ROOF: Covered with 5-ply, The Barrett Co. Deck—covered with slate laid in mastic.
FIREPLACE: Damper—H. W. Covert Co.
SHEET METAL WORK: Flashing, gutters and leaders—copper. Ducts—galvanized iron.
INSULATION: Roof—4 in. mineral wool, Johns-Manville.
WINDOWS: Sash—steel casement, Croft Steel Windows, Inc. Glass— $\frac{1}{4}$ in. polished plate. Screens—aluminum, copper mesh, Zero Co.
FLOOR COVERINGS: Main rooms—oak. Kitchen and bathrooms—resilient tile, Tile-Tex Co.
WALL COVERINGS: Library—solid oak, flush.
WOODWORK: Cabinets—oak. Interior doors—Roddie Lumber & Veneer Co.
HARDWARE: By John R. Schoemer.
ELECTRICAL INSTALLATION: Wiring system—BX and conduit. Fixtures—T. S. Kelley.
KITCHEN EQUIPMENT: Cabinets—Steeline Kitchens Co.
BATHROOM EQUIPMENT: By American Radiator-Standard Sanitary Corp. Cabinets—G. W. Ketcham Co.
HEATING: Fox Sunbeam furnace, radiators and valves—American Radiator-Standard Sanitary Corp. Oil burner—Petroleum Heat & Power Corp. Regulator—Minneapolis-Honeywell Regulator Co.
BUILDERS: MURPHY BROTHERS AND BRINKWORTH



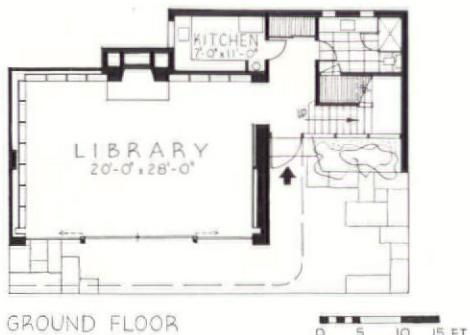
LIBRARY



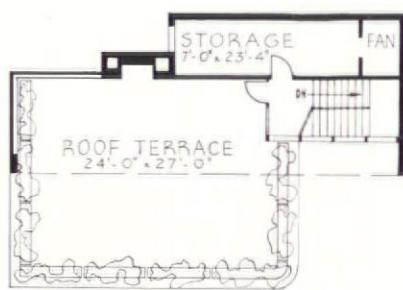
LIBRARY BUILDING FOR FRANK ALTSCHUL, STAMFORD, CONN.

EDWARD D. STONE, ARCHITECT

VIRGINIA CONNER, INC., INTERIOR DECORATOR



GROUND FLOOR



SECOND FLOOR

VIEW FROM LIBRARY

Ezra Stoller Photos



HOUSE FOR GEORGE P. MARSHALL

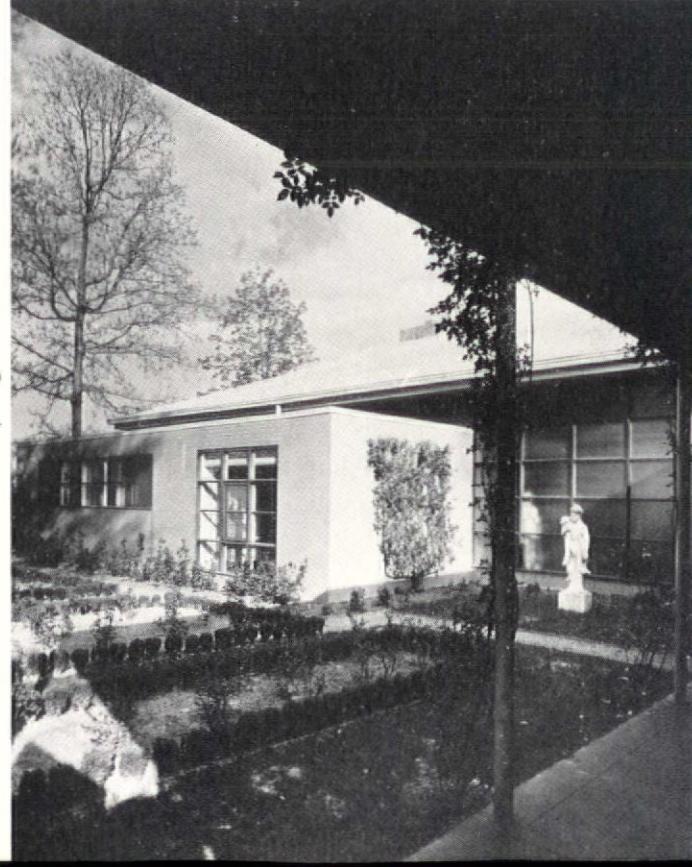
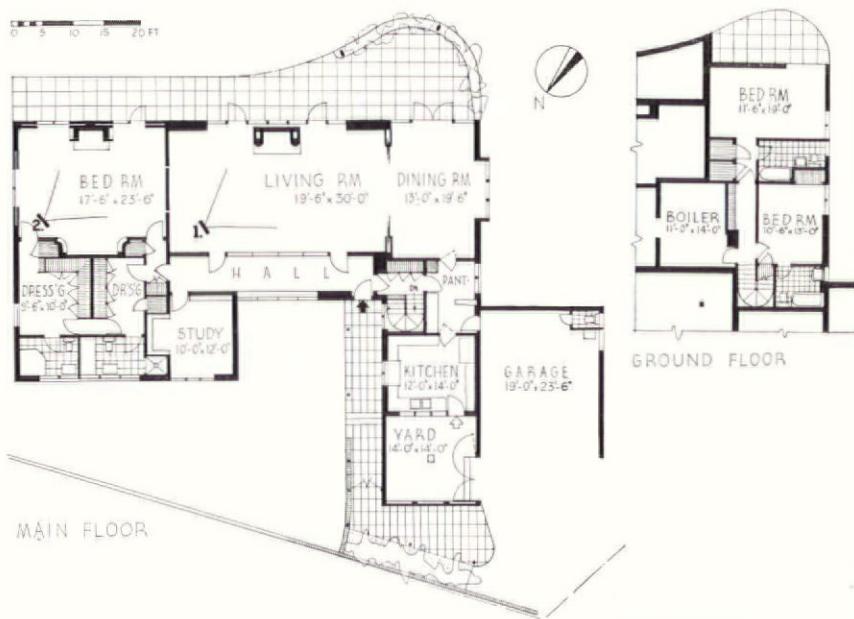
WASHINGTON, D. C.



GARDEN SIDE

Ezra Stoller Photos

ENTRANCE PORCH

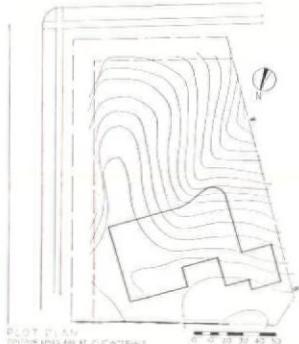


EDWARD D. STONE, ARCHITECT

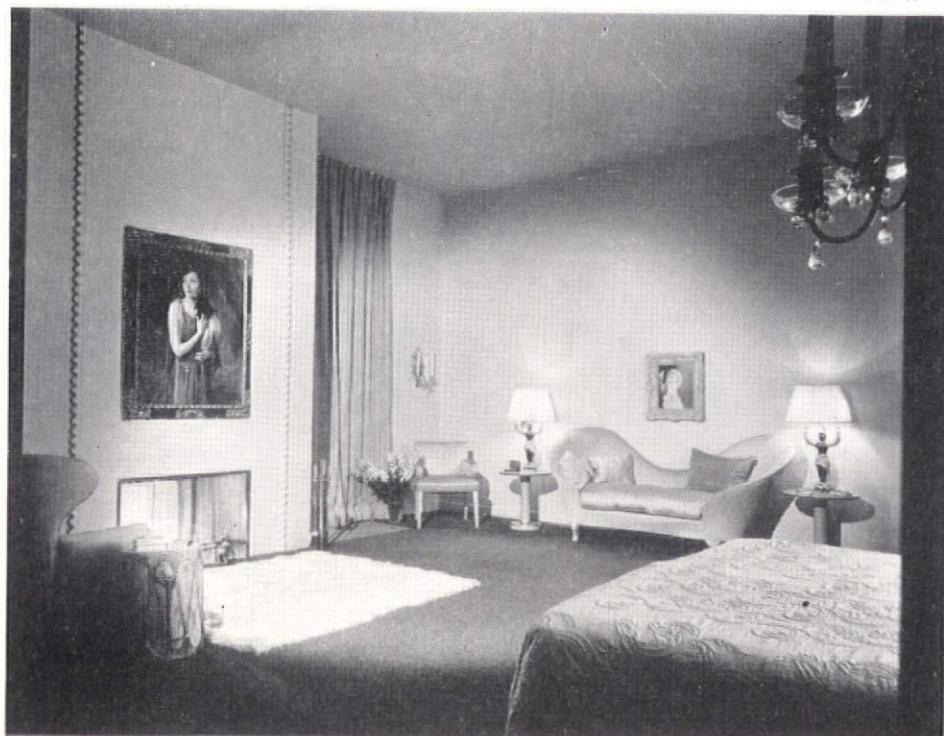
PAUL T. FRANKL, DESIGNER



VIEW 1.



VIEW 2.



An important characteristic of Stone's work is that the design solutions show no rigid adherence to formula, indicating a continuing process of development on the part of the architect and a healthy respect for the special conditions of each job. This house is a good case in point. Sliding doors were used on the garden front, and the budget made it necessary to use wood; this, in turn meant that the doors needed muntin bars for bracing to avoid excessive thickness. The result was a comparatively small pane of glass which was adopted as standard for the house. The unusual living room fireplace grew out of the owner's request for a window directly above it, solved by the design of a free-standing unit with two flues. A change in ground level made it possible to obtain two bedrooms with baths beneath the main floor; reached by an inconspicuous stair at one end of the entrance hall, their placing assures complete privacy for owner and guests.

CONSTRUCTION OUTLINE

STRUCTURE: Exterior walls—brick veneer, wood studs; inside—metal lath and plaster. Floor construction—wood frame carried on steel girders.

ROOF: Covered with asbestos shingles, Johns-Manville.

INSULATION: Attic floor—4 in. rockwool, Johns-Manville. Weatherstripping—Chamberlin Metal Weather Strip Co.

WINDOWS: Sash—white pine, double hung and casement. Glass—Pittsburgh Plate Glass Co.

FLOOR COVERINGS: Main rooms—oak. Kitchen and bathrooms—asphalt tile.

WOODWORK: Trim—white pine. Cabinets—plywood. Doors—"Sturdibilt," M. & M. Woodworking Co. Garage doors—Kinnear Mfg. Co.

HARDWARE: By American Hardware Co.

PAINTS: By Pittsburgh Plate Glass Co. and The Reardon Co.

ELECTRICAL INSTALLATION: Wiring system—BX. Fixtures—T. S. Kelley.

BATHROOM EQUIPMENT: By American Radiator-Standard Sanitary Corp.

PLUMBING: Soil pipes—cast iron. Waste and vent pipes—galvanized iron. Hot and cold water pipes—red brass.

HEATING: Split system, American Radiator-Standard Sanitary Corp. Regulators—Minneapolis-Honeywell Regulator Co.

BUILDER: WHITTY CONSTRUCTION CO.

HOUSE FOR ULRICH KOWALSKI, MT. KISCO, NEW YORK

EDWARD D. STONE, ARCHITECT

Among the earliest houses designed by the Stone office, the Kowalski residence shows a plan which is quite up to the standards of the most recent work. Located on a site which commands an excellent view, it has all important rooms placed to take advantage of it. The house is constructed in the form of two adjoining rectangles, the larger of which contains the bedrooms, service quarters and library. In the projecting unit are the dining room, half of the living room and two covered terraces, with a large deck on the roof above. Interiors are characteristically crisp and direct. The admirable use of large unobstructed glass areas is well illustrated in all three of the interior views.



Ezra Stoller Photos

CONSTRUCTION OUTLINE

STRUCTURE: Exterior walls—8 in. cinder block; inside—furring, studs, wire lath and plaster. Columns—4 in. lally. Structural steel—I-beams, C-beams, channel irons, White Plains Iron Works.

ROOF: Covered with 20-yr. Bond, Barrett Co.

SHEET METAL WORK: Flashing—16 oz.

copper.

INSULATION: Walls, roofs and sound insulation—Mica pellets.

WINDOWS: Sash—steel, Hope's Windows, Inc. Glass—quality A plate, Pittsburgh Plate Glass Co. Glass blocks—Structural Glass Block Co. and Pittsburgh-Corning Corp.

FLOOR COVERINGS: Bedrooms—red oak. Living and dining rooms and library—carpet. Remainder—rubber tile, Danbury Rubber Co.

WOODWORK: Trim—white pine. Doors—"Sturdibilt," flush, M. & M. Woodworking Co. Garage doors—Kawneer Door Co.

HARDWARE: By Russell & Erwin Mfg. Co.

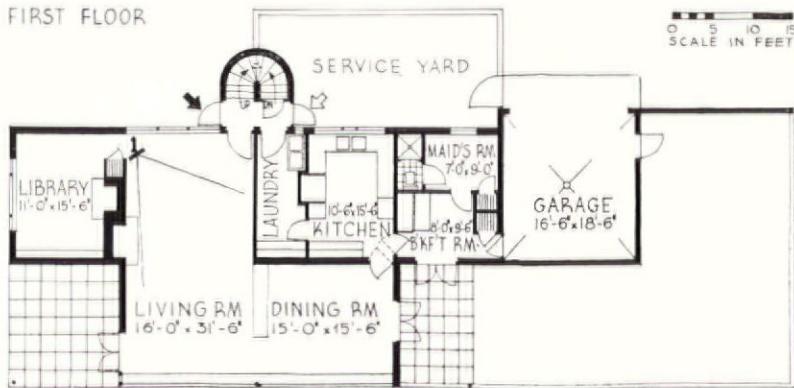
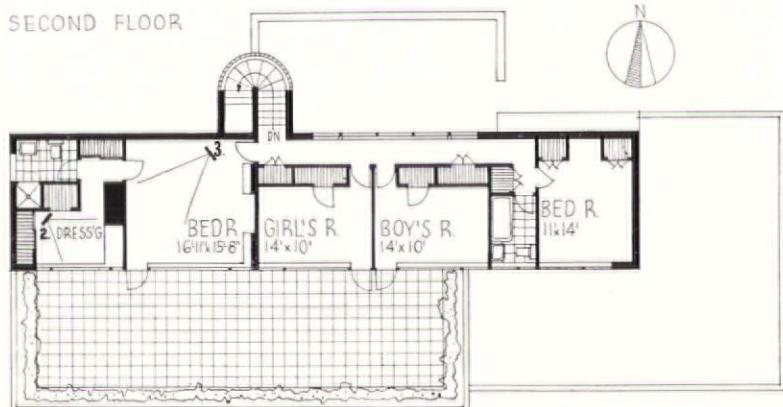
PAINTS: By Pittsburgh Plate Glass Co. and Portland Cement Co.

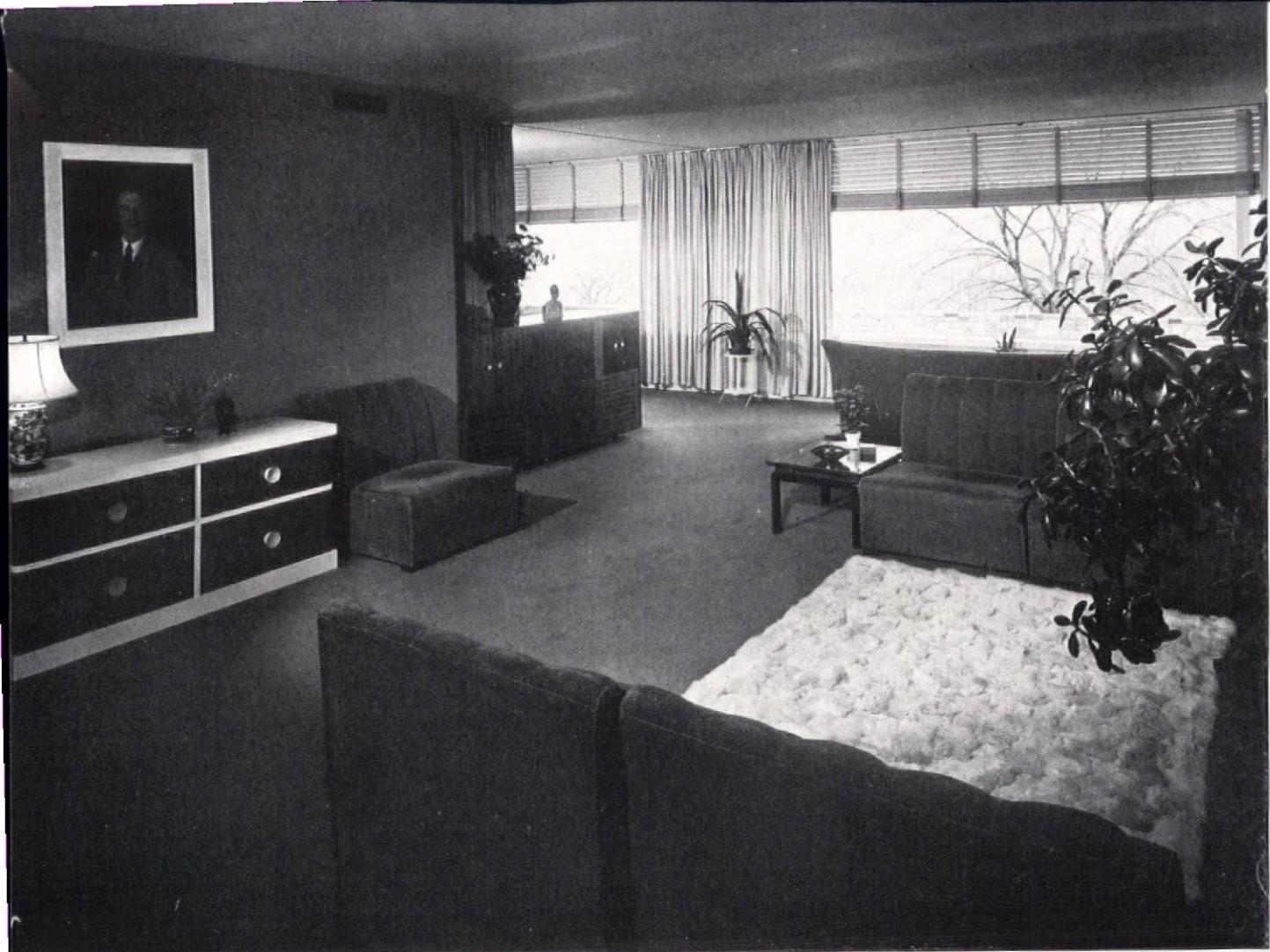
ELECTRICAL INSTALLATION: Wiring system—General Electric Co. Switches—toggle. Fixtures—Kurt Versen. Kitchen fan—Ilg Co.

PLUMBING: Fixtures—American Radiator. Standard Sanitary Corp. Hot and cold water pipes—copper tubing. Kitchen cabinets—metal. Excel Metalcraft Co. Range—American Gas Accumulator Co.

AIR CONDITIONING: Norge Co. winter air conditioner, filtering and humidifying. Grilles—Tuttle & Bailey. Thermostats—Minneapolis-Honeywell Regulator Co.

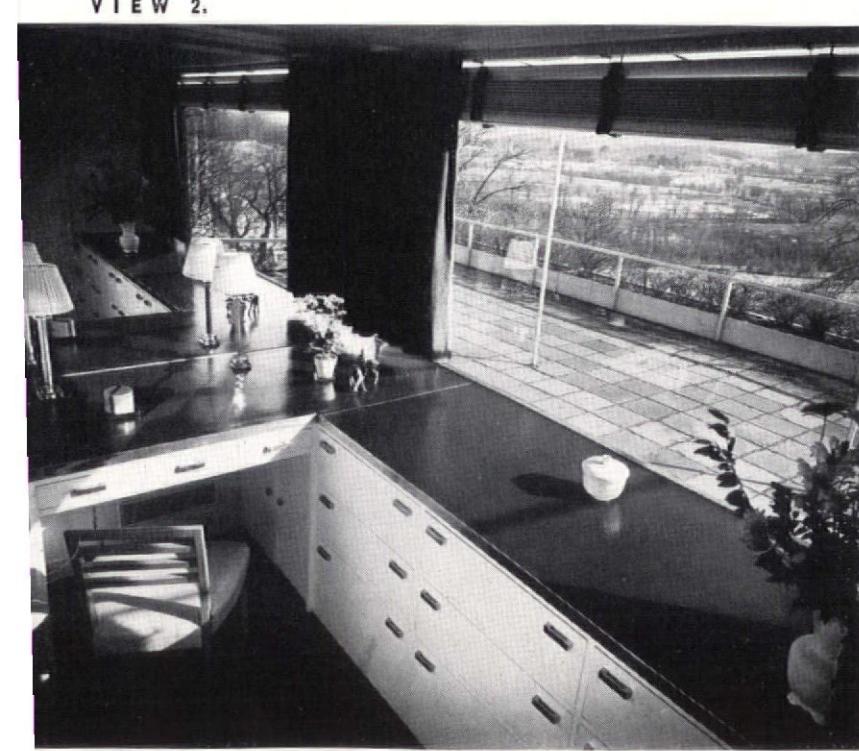
BUILDER: MANNION BROTHERS



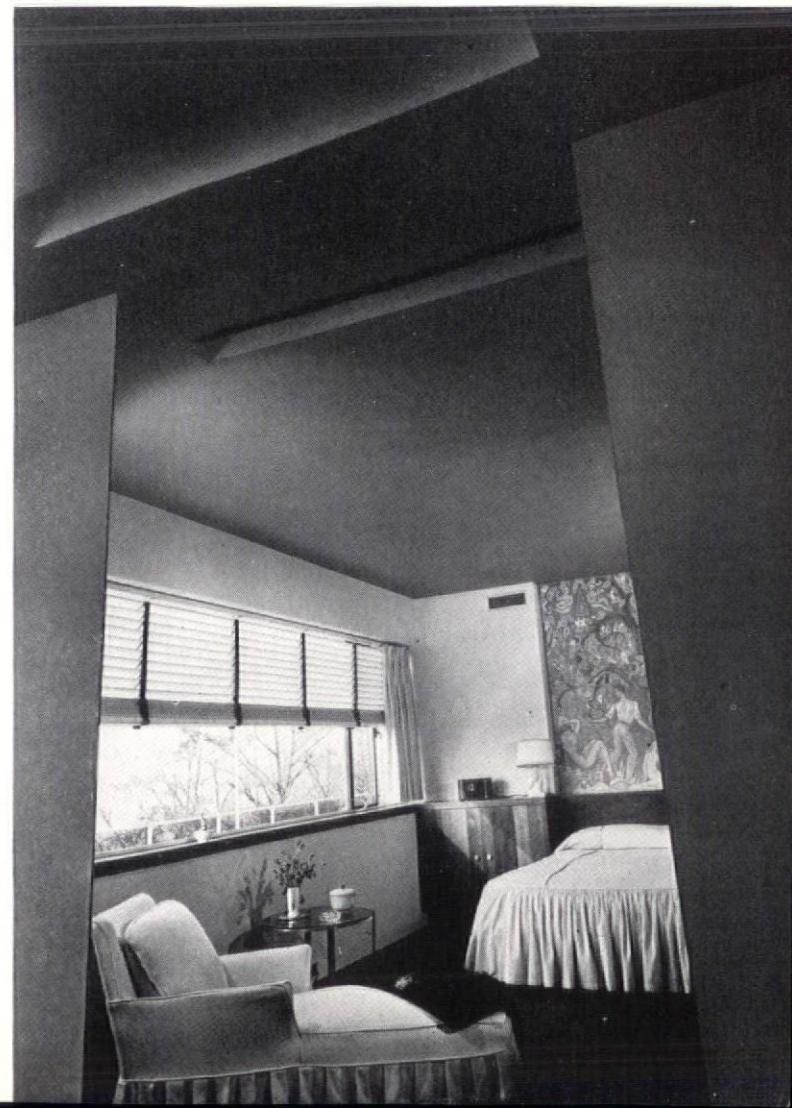


VIEW 1.

VIEW 3.



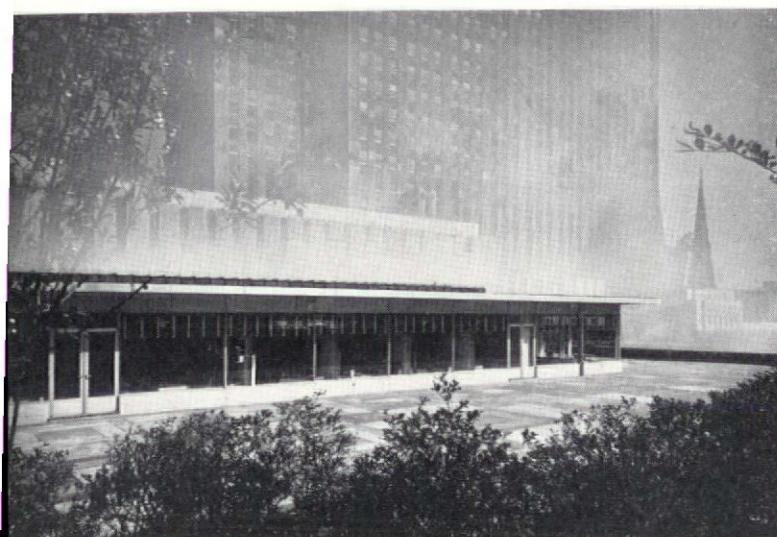
VIEW 2.



OFFICES FOR

EDWARD D. STONE, ARCHITECT

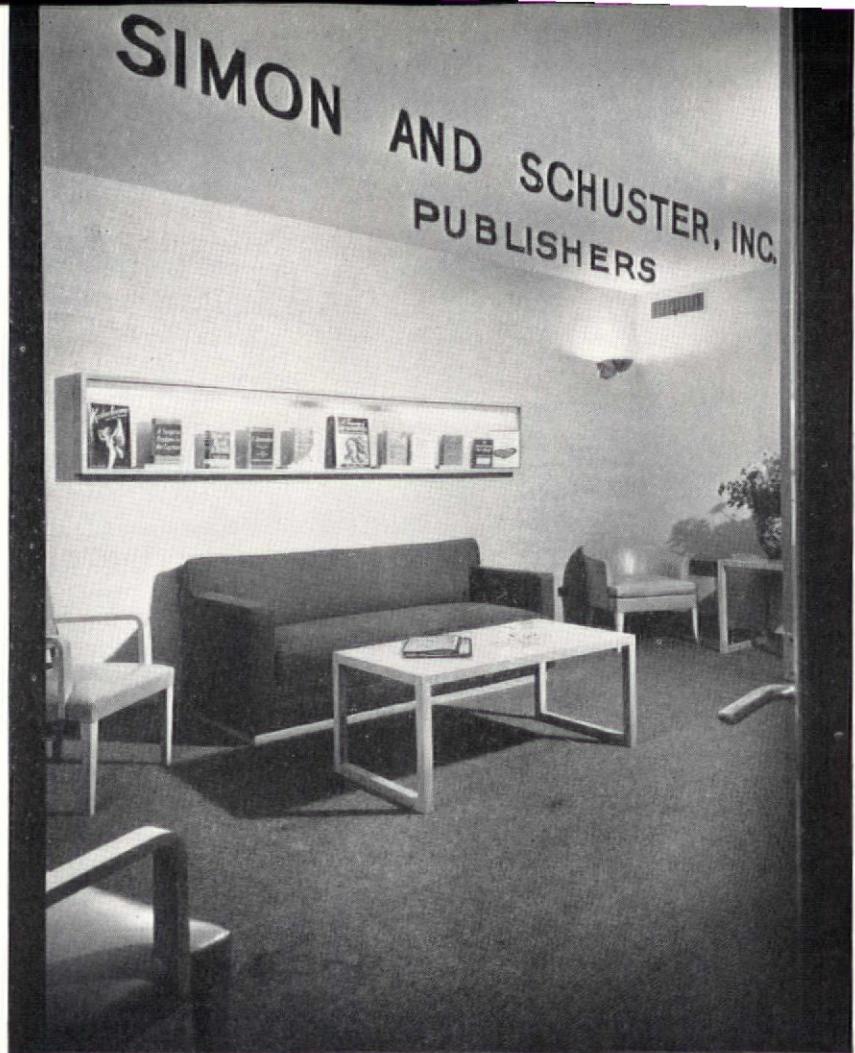
Built as a penthouse atop the Center Theater in Rockefeller Center and entered from the newer and taller U. S. Rubber Co. Building adjoining, this publisher's headquarters marks a new high in office design. Only the reception and mail rooms are within the mass of the parent building. The balance of the space is exposed on three sides and opens on a broad flagged and landscaped terrace. Absence of the restrictions—both legal and practical—which ordinarily control the design of commercial buildings has permitted the use of many features developed in recent residence construction, such as fixed glass walls protected by a deep overhang and cleaned from the outside, and freedom from heavy piers both inside and outside the plan. The building is completely air conditioned, ventilated through continuous louvered openings in a raised portion of the light copper roof.



PAVILION DESIGNED BY
ROCKEFELLER CENTER ARCHITECTS

CONSTRUCTION OUTLINE

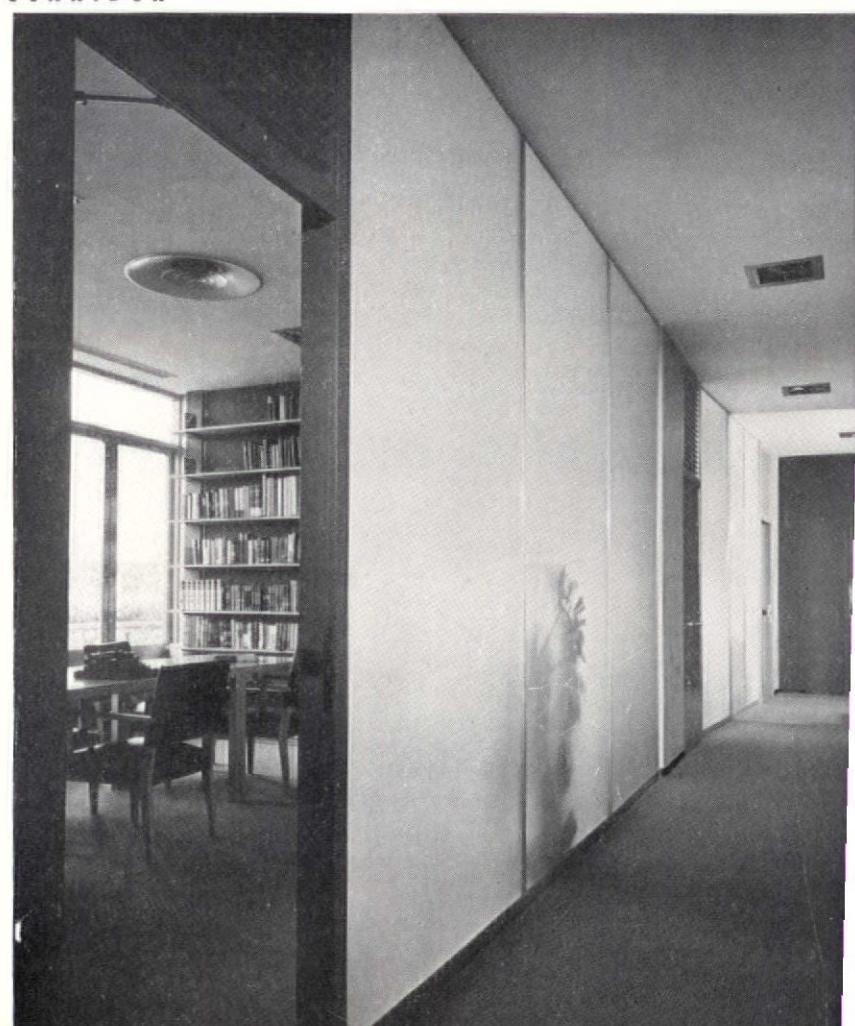
STRUCTURE: Interior partitions—gypsum block and plaster.
WINDOWS: Sash—aluminum, fixed.
FLOOR COVERINGS: Carpeting throughout, Cochrane Looptex, Charles P. Cochrane Co.
WALL COVERINGS: Reception room and portion of walls—grass cloth. Halls—Louvre glass partitions, Pittsburgh Plate Glass Co.
WOODWORK: Cabinets—birch plywood, Murphy Brothers and Brinkworth. Doors—flush, E. F. Hauserman Co. Furniture—designed by Edward D. Stone, built by The Bartos Co., and W. & J. Sloane.
HARDWARE: By P. & F. Corbin.

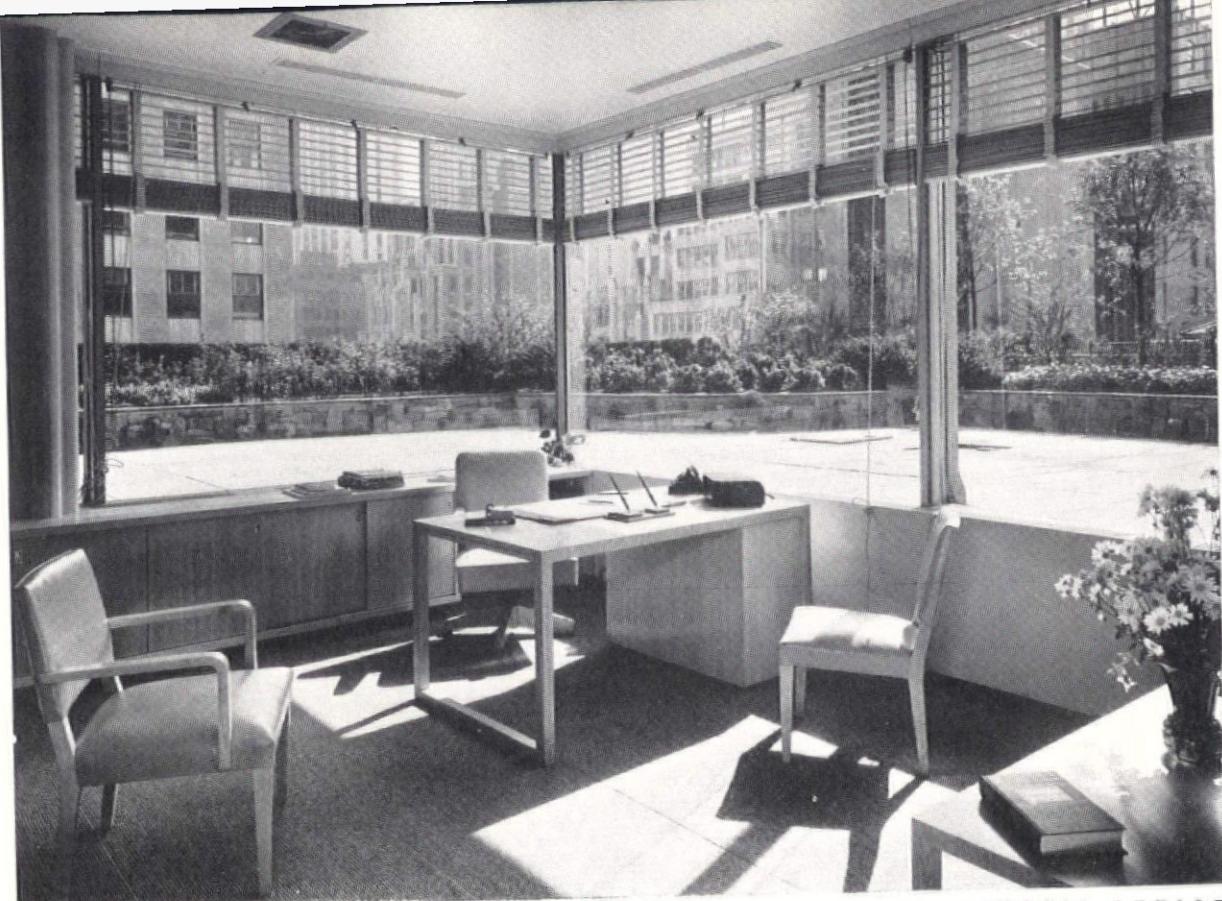


RECEPTION ROOM

Ezra Stoller Photos

CORRIDOR





MR. SIMON'S OFFICE



MR. SCHUSTER'S OFFICE

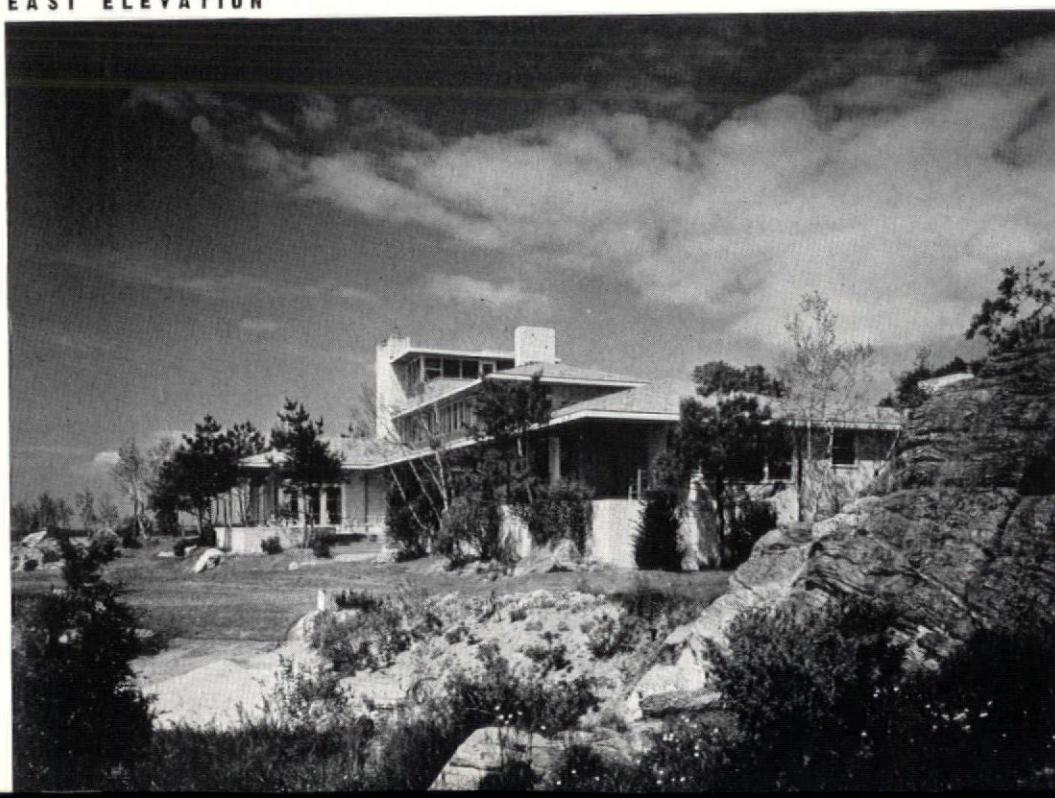




ENTRANCE ELEVATION

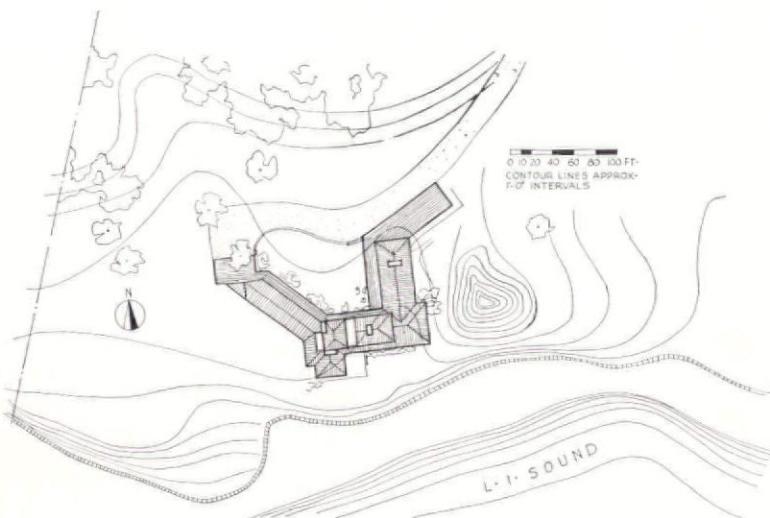
Ezra Stoller Photos

EAST ELEVATION



HOUSE FOR W. T. GRANT EAST RIVER, CONN. EDWARD D. STONE, ARCHITECT

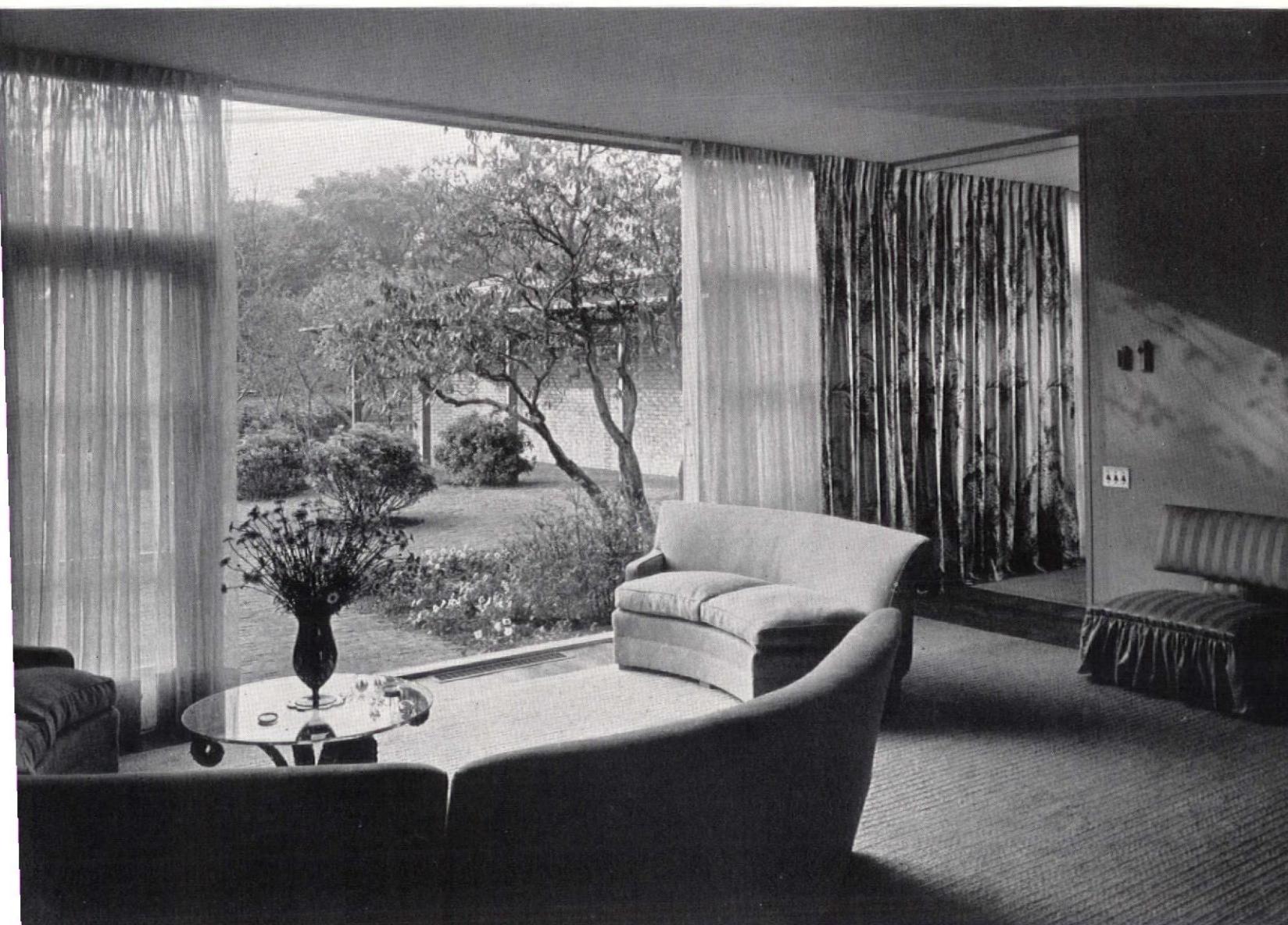
INTERIORS—PHILIP S. GRAY OF R. H. MACY & CO.
L. LUNDQUIST, LANDSCAPE ARCHITECT



Located on the shore of Long Island Sound, the house lies between a park-like area and the water. It was the owner's desire that the main rooms be so arranged that both of these views might be enjoyed. Built for summer and week-end occupancy only, it differs in no essential way from year-round construction.

The atmosphere of luxury created by the house arises not so much from any extravagant use of materials as from the plan, which places almost all of the rooms on one floor level, spreading out in an irregular U with an

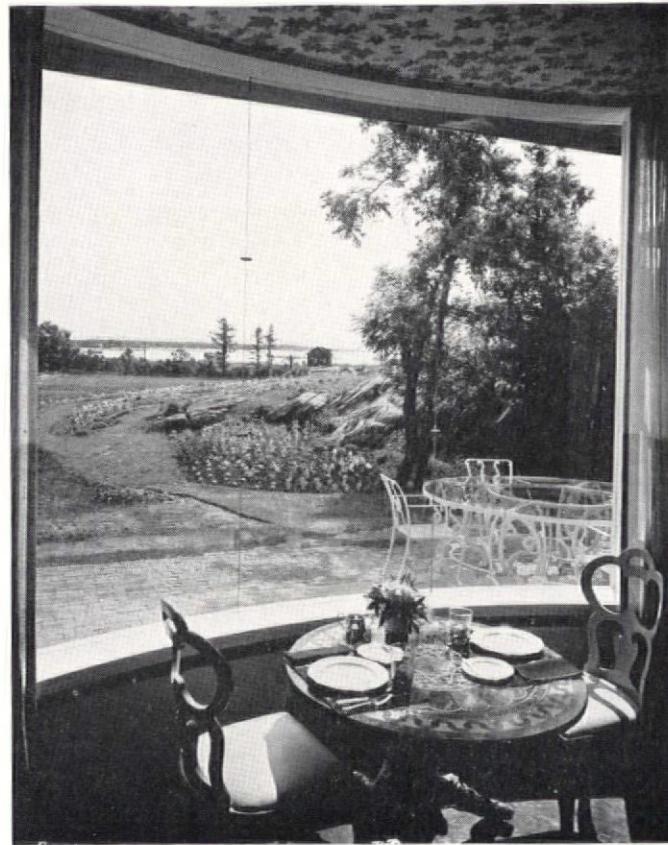
LIVING ROOM



HOUSE FOR W. T. GRANT



EAST ELEVATION



DINING ROOM

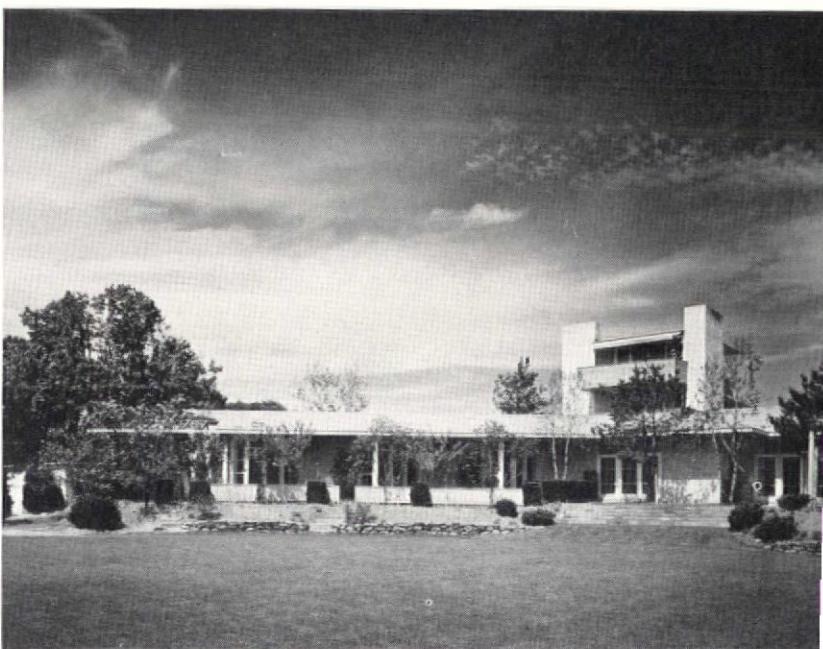
outside dimension of around 300 ft. Upstairs rooms consist only of a few bedrooms, and a studio on the third floor level.

Sleeping rooms at ground level are divided into three groups. One is occupied by the owner, and includes a sitting room and office, a second is used by the servants, and the last serves the guests. Privacy for the guest unit is very ingeniously and attractively achieved by the saw-tooth scheme, which provides windows on two sides and a small private garden in front of each room.

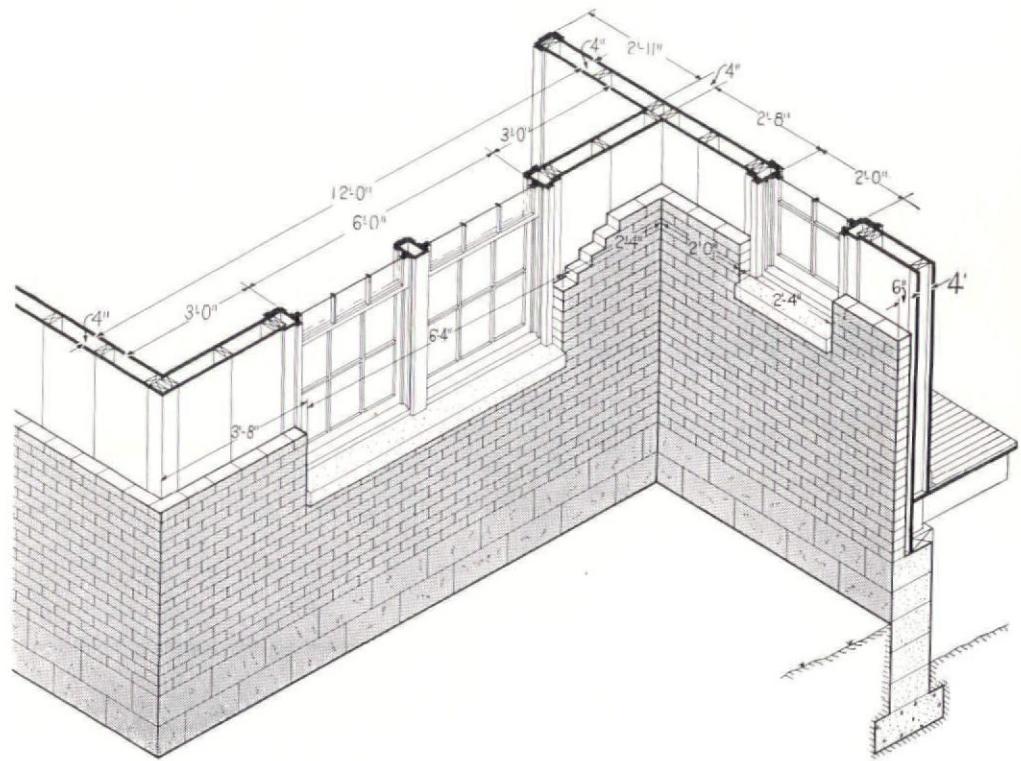
The house is used a great deal for informal entertaining, and the living quarters, which include a large game room and porch, leave little to be desired in this respect. The quality of openness achieved in this section of the house is especially pleasant, and the provisions for closing off some of the rooms make for added flexibility in use. Placing of the game room fireplace is interesting, as it has the added function of screening the glazed loggia which serves as corridor to the guest bedrooms.

Exterior materials are redwood, bleached to a light tan, brick, and a gray asbestos shingle roof. Here, as in the other houses, the architect demonstrates his ability in successfully combining materials in a manner that is crisp and warm at the same time. Interiors show the same characteristics, with painted and papered walls, plain and patterned fabrics, and old and new furniture combined to produce an atmosphere of informal comfort.

GUEST WING



PRODUCTS AND PRACTICE



MODULAR masonry is at last available which permits coordination of brick, concrete block, and cast stone with wood framing, sheet materials, and stock wood windows on a uniform 4 in. basis. Shown is a corner in a brick veneer wall in which the window widths (2 ft. and double 2 ft. 10 in.) have been picked to coincide with regular 16 in. stud spaces and located accordingly, so that stud spacing and joints in sheet materials bear a planned relationship to the openings.

MODULAR DESIGN

It is no news that coordination of dimensions is considered one of the best ways to cure present chaos in construction, but it is news indeed that something practical, comprehensive and of immediate applicability is at last being done about it. Architects have long recognized that the use of some common denominator of design, on which the sizes of building products could be based, would immensely simplify their job of fitting together the diverse materials and equipment which make up a modern building. Builders have cursed the perversity of dimensions which required cutting and fitting of masonry units or involved picayune, hard-to-check fractional dimensions. Manufacturers have tried unsuccessfully to appease a seemingly never-satisfied demand for variety of sizes and shapes which has increased costs and delayed deliveries, or sat tight on arbitrary sizes established without reference to related products which multiplied job labor and waste. But until very recently, no really successful effort had been made to correct a situation which everyone recognized as unfortunate.

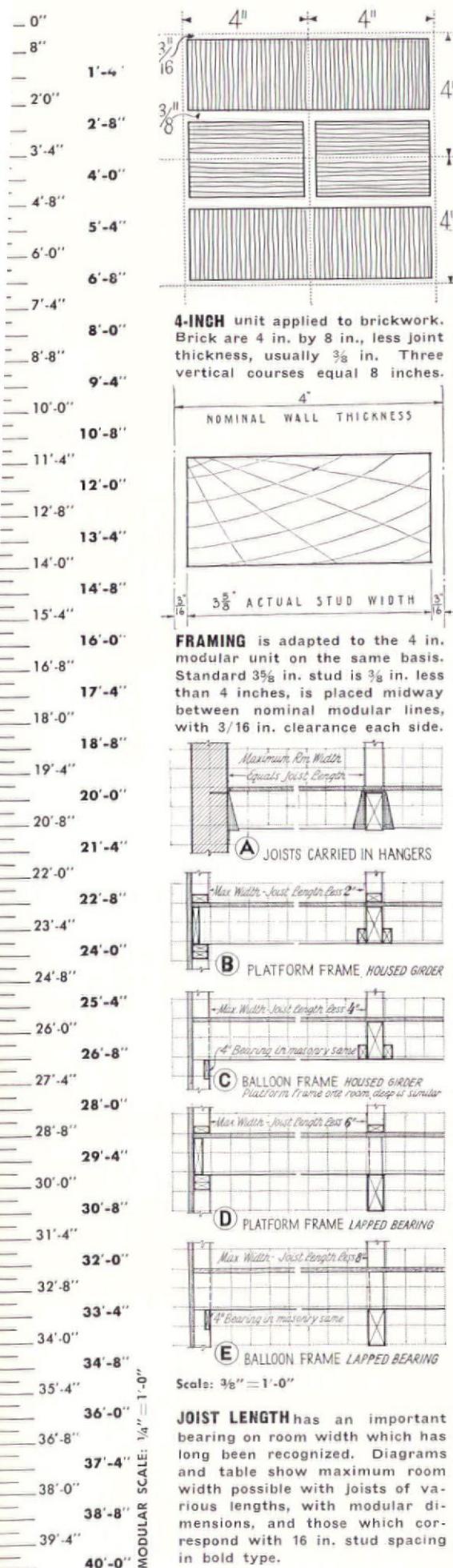
Individual architects, following their several individual bents, worked out modular design methods which worked well for their intended purpose, but were of little value to others. Prefabricators, in developing systems of sectional construction, perforce adopted the section-sized module for their designs. Manufacturers of masonry materials, particularly clay products, pushed the idea of the masonry unit as the basis of design—without, in most cases, first agreeing to put the basic unit on a rational, easy-to-use basis. Out of these contradictory trends, there finally emerged the realization that what was needed was a unit small enough to be universally applicable, yet large enough to reduce considerably the variation in dimensions common in present practice. And out of the demand for such a modular unit,

stimulated in no small part by THE FORUM in its article *The Integrated House* (April, 1937), came Project A 62 of the American Standards Association, sponsored by the A.I.A. and devoted to the furtherance of the modular idea among architects on the one hand, and manufacturers of building products on the other.

Project A 62 began its herculean task in July, 1939, with the able assistance of the Modular Service Association, a non-profit organization founded by Bemis Industries, Inc., and the cooperation of interested groups throughout the building industry. In its less-than-two-years' existence, it has already succeeded in developing, on the basis of a 4 in. increment, simplified brickwork which is available on order throughout the New England States and in many other parts of the country, and in coordinating this development with other forms of masonry such as back up tile, cast stone, and concrete block and with present stock sizes of framing lumber, wood windows and doors. It has developed hundreds of tentative standardized details, covering windows, doors, masonry work, floor joists, etc., many of which are available to architects on demand.* Even more important, it has explored and perfected a basic *method* which the individual architect can apply to a host of other materials in everyday use, regardless of the type of construction or design he chooses to employ.

Although the overall objectives of the project are still far from achieved, it is already possible to apply this basic method to particular jobs with real benefit. As a guide to those who may wish to do so, THE FORUM herewith presents its own interpretations of the application of project findings to light construction in brick or frame.

*Simply write Committee A 62, 110 Arlington St., Boston, Mass.



NOMINAL AND ACTUAL DIMENSIONS

First essential of the modular method which has been developed is a careful distinction between nominal dimensions, used to locate walls, partitions, and other intersecting structural elements, and the actual thickness of these elements. There is nothing new in this practice: it is already universally used in locating—and at the same time designating the thickness—of interior partitions. Thus frame partitions are commonly dimensioned as 4 inches, rough to rough, despite the fact that their actual thickness is $3\frac{5}{8}$ in. or $3\frac{3}{4}$ inches. This is done in order to avoid fractional dimensions, and with the tacit understanding that the partition will actually be centered between two lines 4 in. apart or, in some cases, aligned on one side.

In modular planning, this practice is made a consistent principle, and applied to exterior walls as well as interior partitions. Far from complicating present methods of dimensioning plans, this results in considerable simplification. Fractional dimensions now used to designate the thickness of exterior walls are eliminated, and with them, fractional figures for distances between such walls. Inconsistencies which otherwise occur where interior partitions align with internal corners of exterior walls are done away with. And, since dimensions are confined to multiples or simple fractions of the 4 in. integer, they may be measured with such accuracy that the ordinary scale becomes a sufficiently accurate "adding machine" for totaling dimension strings.

All of the figures on the modular plan, including overall dimensions, refer to the nominal faces of walls or partitions, rather than their actual faces, which in most cases are a uniform $\frac{3}{16}$ in. inside this nominal line. This compensates for the difference between nominal and actual sizes of framing lumber and, in masonry, allows for the necessary mortar joint. By a happy coincidence, the $\frac{3}{8}$ in. difference between the

nominal and actual size of the standard 2×4 is also the dimension of the average mortar joint, so that the width of the modular brick corresponds to the standard $3\frac{5}{8}$ in. stud. Exactly the same principle is applied to larger masonry units, such as concrete block, back-up tile, face tile, etc., which in their present nominal sizes are easily adapted to the 4 in. module. Where larger or smaller mortar joints are desirable, the actual size of the masonry units is varied accordingly, actual dimensions of the units being in all cases the modular size less the thickness of the joint.

If this seems complicated, remember that whatever the size of the masonry unit, joint thickness must be taken into account. Brick actually 4 in. wide would result in walls $8\frac{3}{8}$ in. and $12\frac{3}{4}$ in. in thickness, brick 8 in. long in piers 2 ft. $9\frac{1}{8}$ in., 3 ft. $5\frac{1}{2}$ in. wide, etc., while brick 4 x 8 in. are in fact impossible since in order to form corners two headers plus one joint must equal one stretcher. This, of course, has always been taken into account in sizing masonry units as well as many other building materials; modular masonry simply integrates this practice with the easily added, easily scaled, uniform 4 in. module—and provides a system of notation for plans and details consistent with actual sizes and actual assembly of such materials.

JOIST LENGTHS

The use of the 4 in. nominal unit as the module of masonry and frame construction provides the basis for standardized assembly details, window sizes, etc., without in any way limiting the designer to any larger dimension unit, and no such unit is contemplated in the work of Project A 62. In practice, however, larger units do exist which should be taken into account as far as feasible if the economies of dimensional coordination are to be fully realized. The largest of these, and at the same time one of the most important, is that imposed by standardized lengths of framing lumber, especially joist lengths.

JOIST LENGTHS, MAXIMUM ROOM WIDTHS, AND STUD SPACING

JOIST LENGTH	BEARING CONDITION (SEE DIAGRAMS)					REMARKS
	A	B	C	D	E	
8 ft.	8'-0"	7'-10"	7'-8"	7'-6"	7'-4"	A coincides with stud centers and joints of 4 ft. dry finishes
10 ft.	10'-0"	9'-10"	9'-8"	9'-6"	9'-4"	E coincides with stud centers
12 ft.	12'-0"	11'-10"	11'-8"	11'-6"	11'-4"	A coincides with stud centers and joints of 4 ft. dry finishes
14 ft.	14'-0"	13'-10"	13'-8"	13'-6"	13'-4"	E coincides with stud centers
16 ft.	16'-0"	15'-10"	15'-8"	15'-6"	15'-4"	A coincides with stud centers and joints of 4 ft. dry finishes
18 ft.	18'-0"	17'-10"	17'-8"	17'-6"	17'-4"	E coincides with stud centers
20 ft.	20'-0"	19'-10"	19'-8"	19'-6"	19'-4"	A coincides with stud centers and joints of 4 ft. dry finishes

Much waste can be avoided by observing these larger units, less whatever is required to provide proper bearing. Where joists are supported in hangers, with nothing deducted for bearing, room width in the direction of the span should be a multiple of 2 ft. All other bearing conditions, taking into account the 4 in. unit, fall into two groups: those where the deduction is 4 in. and those where 8 in. must be deducted. The table at the bottom of the opposite page shows how this works out for joists of various lengths and with various bearing conditions.

STUD SPACING

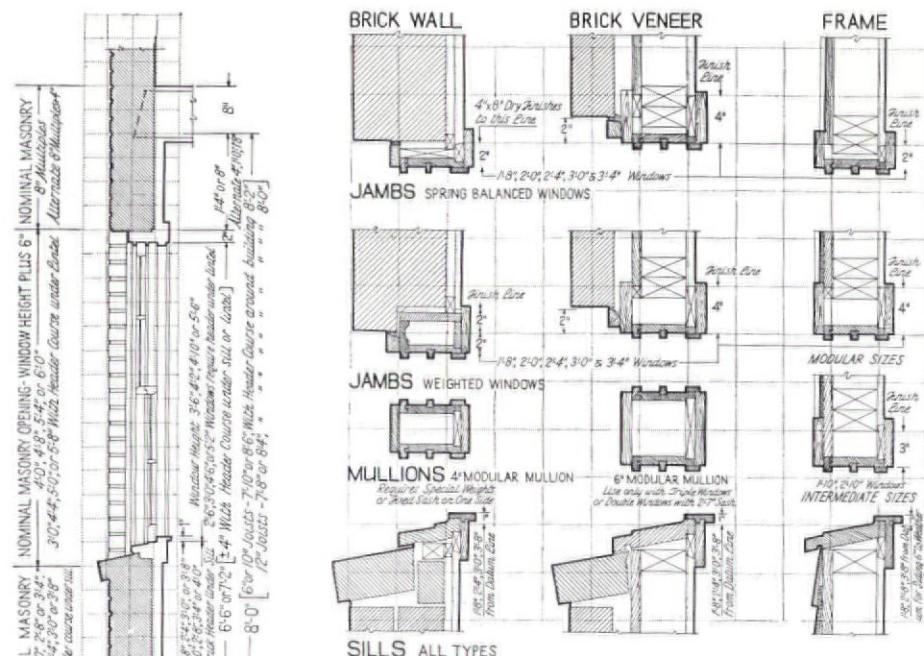
Still another factor which may be considered in deciding room sizes is the spacing of framing, especially studs. This is particularly worthwhile when using sheet finishes with exposed joints, where the use of the 16 in. unit of standard framing will accomplish almost as much in avoiding waste and improving appearance as a slavish regard for the decidedly less flexible unit suggested by the 4 x 8 ft. dimensions of the sheets themselves.

Moreover, as the joist table shows, the 16 in. unit may be coordinated with the factor of joist length at two usable room widths, 9 ft. 4 in. and 13 ft. 4 in., whereas 4 ft. units can only be made to agree with joists where there is no deduction for bearing. As a result, many a plan has been "coordinated" on the basis of wallboard width only to result in maximum waste of framing lumber, with 14 ft. joists used for 12 ft. rooms in order to provide the needed 4 or 8 in. bearing. Dimensions at right angles to the joists, on the other hand, may well be based upon the 4 ft. width of the sheets, and adjusted to 1 and 2 ft. framing centers where these are used.

WINDOWS

Stock wood windows, both double hung and casement types, are already well adapted for use with the 4 in. module. Six out of ten of the widths commonly stocked, and all but one of the nine common heights may be used with modular masonry with uniform, standardized sill, jamb, and head details. Crux of these details is the relationship between the window opening and the modular lines, which is fixed for each

type of installation. In solid masonry, the jamb of window occurs midway between modular lines, 2 in. from each, while the masonry opening coincides with the modular line. In brick veneer, where the use of a 2 in. space between the brick and studs results in the brick being centered on the coordinates, this situation is exactly reversed. In frame, weighted windows are placed so that the jamb occurs on the module for modular-width windows (4 in. multiples)

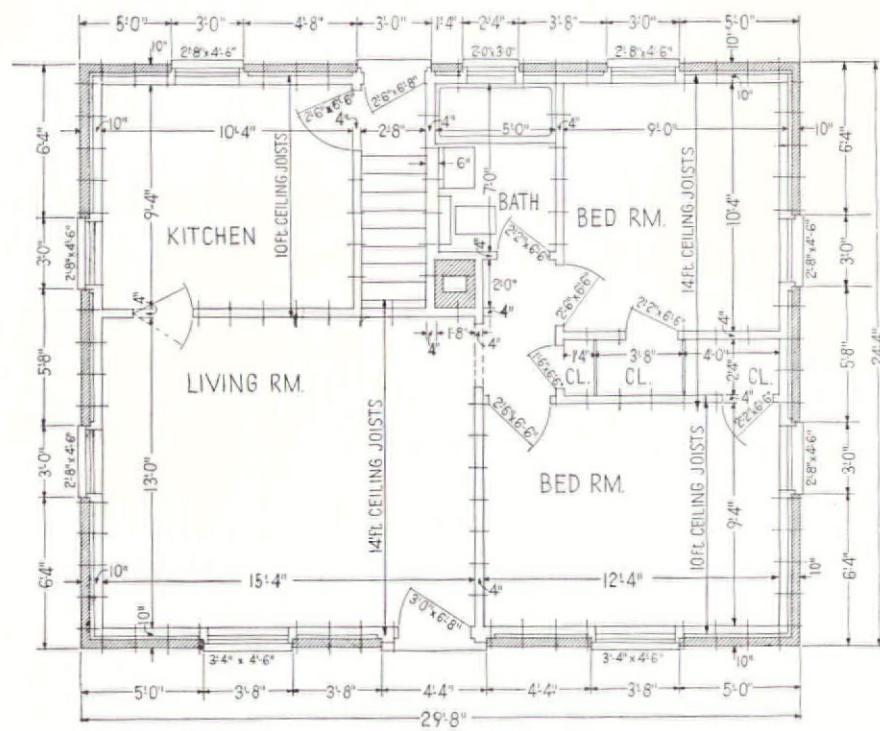


Scale: 3/4" = 1'-0"

WOOD WINDOW sizes are well adapted to the 4 in. unit, considerably more than half of the standard widths and almost all of the standard heights fitting modular masonry with a single set of details. Diagrams show relationship of the window to modular lines, table indicates preferred sizes. Vertical relationships are shown at the left.

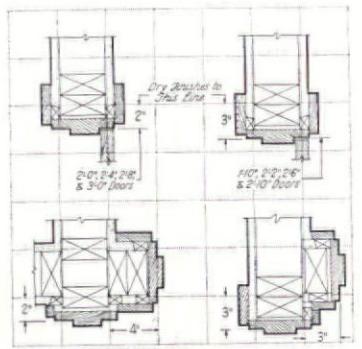
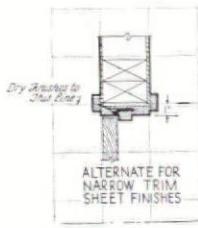
WOOD WINDOW WIDTHS, MODULAR MASONRY OPENINGS, AND JOINT-TO-JOINT DIMENSIONS FOR DRY FINISHES

DOUBLE-HUNG WINDOWS, IRON WEIGHTS				SPRING BALANCE AND CASEMENT WINDOWS				
SASH WIDTH	MASONRY OPENING	JOINT TO JOINT DIMENSIONS		MASONRY OPENING	JOINT TO JOINT DIMENSIONS		SASH WIDTH	REMARKS
		Masonry & Veneer	Alternate for Frame		Masonry & Veneer	Alternate for Frame		
1'- 6"	1'-10"	2'- 2"	2'- 0"	1'-10"	1'-10"	2'- 0"	1'- 6"	Frame construction only
1'- 8"	2'- 0"	2'- 4"	2'- 2"	2'- 0"	2'- 0"	2'- 2"	1'- 8"	
1'-10"	2'- 2"	2'- 6"	2'- 4"	2'- 2"	2'- 2"	2'- 4"	1'-10"	Frame construction only
2'- 0"	2'- 4"	2'-8"	2'- 6"	2'- 4"	2'- 4"	2'- 6"	2'- 0"	Joints for weighted window coincide with stud spacing
2'- 4"	2'- 8"	3'- 0"	2'-10"	2'- 8"	2'-8"	2'-10"	2'- 4"	Joints for spring window coincide with stud spacing
2'- 7"	2'-11"	3'- 3"	3'- 1"	2'-11"	2'-11"	3'- 1"	2'- 7"	"Odd" size window, useful in pairs with 6" mullion
2'-10"	3'- 2"	3'- 6"	3'- 4"	3'- 2"	3'- 2"	3'- 4"	2'-10"	Frame construction only
3'- 0"	3'- 4"	3'- 8"	3'- 6"	3'- 4"	3'- 4"	3'- 6"	3'- 0"	
3'- 4"	3'- 3"	4'-0"	3'-10"	3'- 8"	3'- 8"	3'-10"	3'- 4"	Joints for weighted window coincide with stud spacing
3'- 8"	4'- 0"	4'- 4"	4'- 2"	4'- 0"	4'-0"	4'- 2"	3'- 8"	Joints for spring window coincide with stud spacing



Scale: $\frac{1}{8}'' = 1'-0''$

APPLICATION of modular planning principles to a typical low cost house. All dimensions are multiples of 4 inches; stud center-lines show how framing has been taken into account in locating partitions and door and window openings.



Scale: $\frac{3}{4}'' = 1'-0''$

DOORS of all standard sizes are adapted to modular planning by the use of appropriate details. Modular sizes (4 in. multiples) should be placed 2 in. from the coordinates, intermediate sizes 3 in. from this line. Table shows relationship to stud spacing.

BRICK SCALE (3/4'' = 1'-0'') FOR MODULAR MASONRY

RESULTS

The plan at the left illustrates the application of these principles to a typical low cost house. In order to show modular design in its most complicated form, brick veneer construction has been shown rather than frame or solid masonry, either of which would be simpler. Nevertheless, the process of working out the plan on a modular basis is shown to be no more difficult—and, in some respects, less difficult—than the conventional hit-or-miss approach. The result is a house that is easier to build, better to look at, and less wasteful of materials.

All of the dimensions on the plan are multiples of the basic 4 in. module. This means that there will be no cut brick or spread joints to compensate for arbitrary figures which do not correspond with the masonry units. It also means that every dimension on the plan can be accurately scaled and totals quickly checked; the exact relationship between any two elements in the structure determined from the small scale drawings by reference to standardized assembly details.

In addition to the 4 in. module, other factors controlling dimensions have been taken into account. Joist spans are determined by joist length and stud spacing, with a 4 in. reduction in the longer span so as to maintain the regular stud spacing on the outside of the building. Location of most of the interior partitions, and at least one jamb of all openings, has also been based on stud spacing so that sheet finishes may be cut on 16 in. lines with maximum salvage and minimum waste, and exposed joints will occur at pre-planned points.

No one plan, however, can begin to show all of the ways that modular planning can help building. Actually, its basic principles can be applied in hundreds of different ways to all types of design and construction. It already pays sizable dividends in lowered cost and improved appearance; its widespread adoption will multiply the return by encouraging further rational standardization.

DOOR WIDTHS AND JOINT-TO-JOINT DIMENSIONS FOR DRY FINISHES

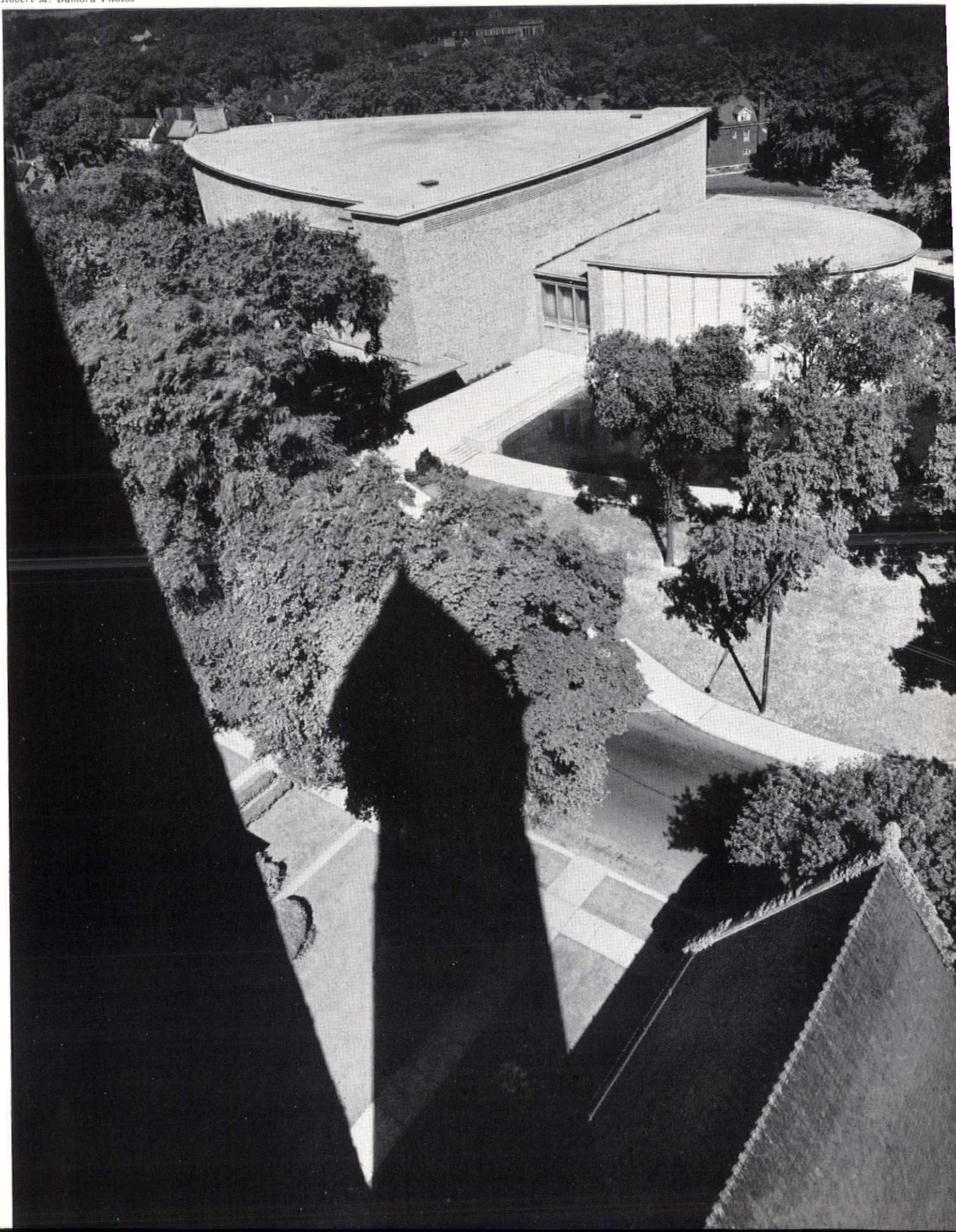
MODULAR SIZES		INTERMEDIATE SIZES			REMARKS
DOOR WIDTH	JOINT TO JOINT DIMENSION	DOOR WIDTH	JOINT TO JOINT DIMENSION Detail A	Detail B	
		1'- 6"	2'- 0"	1'- 8"	
1'- 8"	2'- 0"	2'- 2"	2'- 8"	2'- 4"	Detail A coincides with studs
2'- 0"	2'- 4"	2'- 6"	3'- 0"	2'- 8"	Detail B coincides with studs
2'- 4"	2'- 8"				2'- 4" door coincides with studs
2'- 8"	3'- 0"	2'- 10"	3'- 4"	3'- 0"	
3'- 0"	3'- 4"				

KLEINHANS MUSIC HALL BUFFALO, N. Y.

F. J. & W. A. KIDD, ARCHITECTS

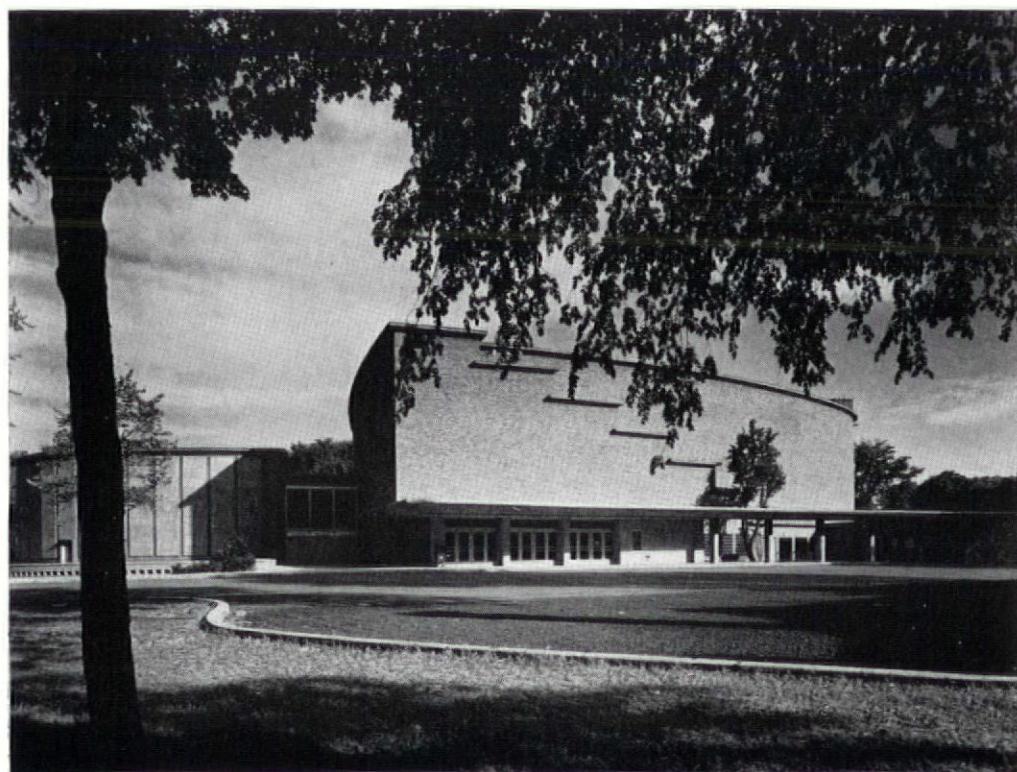
ELIEL SAARINEN, ASSOCIATE

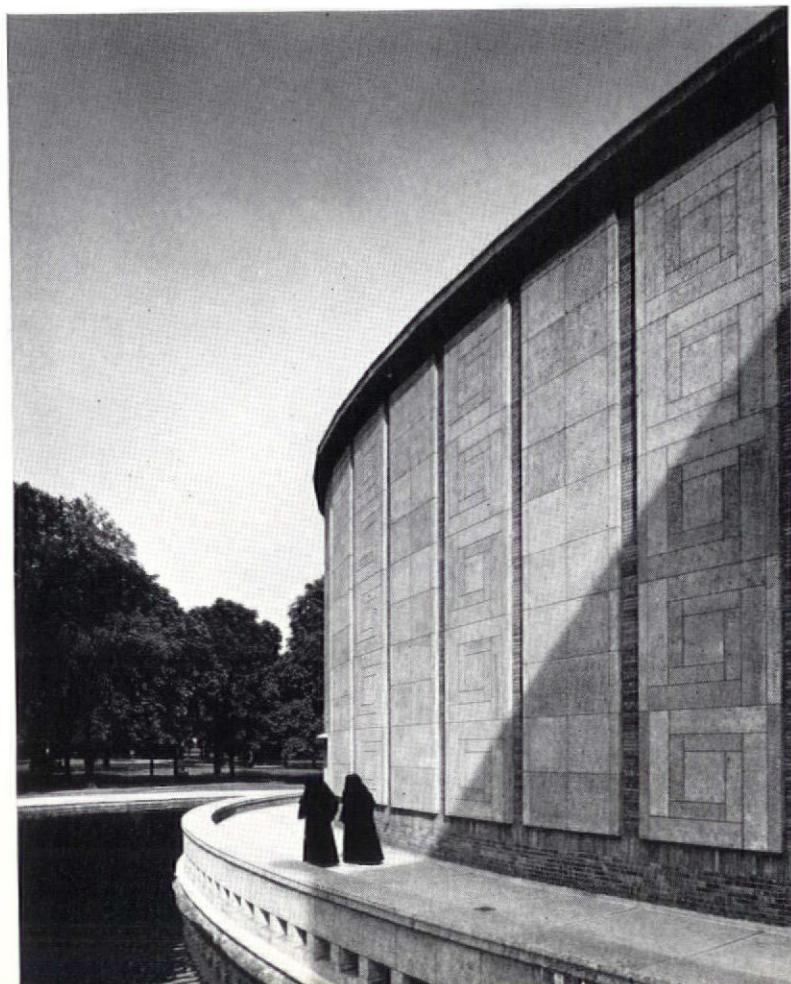
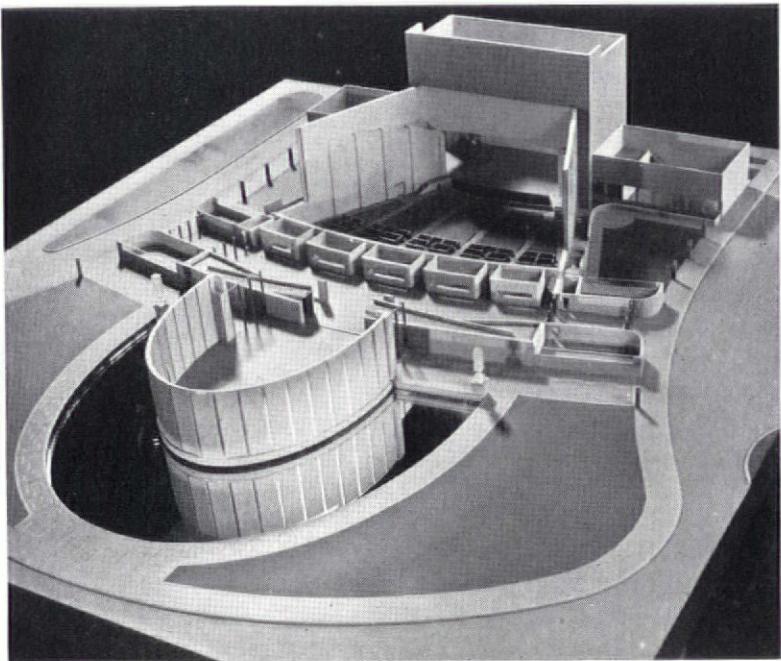
Robert M. Damora Photos





MAIN ENTRANCE





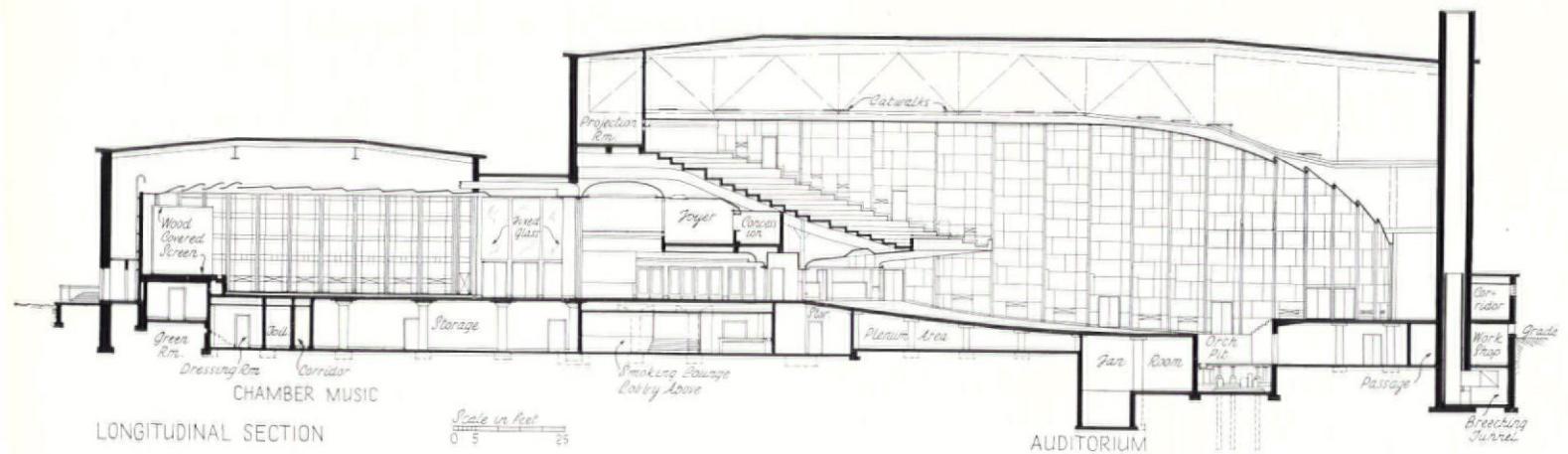
Comment by JOSEPH HUDNUT

To many it will seem strange, in these unquiet times, that men should find the leisure and the heart to build a hall for music: still stranger that in such a hall the builder should continue to practice that patient and subtle chemistry which transmutes into the forms of shelter the passion and grace which we call architecture. The defense of our liberty lays so urgent a burden upon us that we are increasingly impatient with all that does not appear to promote that end; and the speed and scale of our effort has already erased from our habit of vision those niceties of form and texture, of relationship and expression which until recently illuminated oftentimes our everyday experience. The Kleinhans Music Hall appears among us like a ghost from an era which has receded into history with a bewildering speed. It seems to belong to some long-departed youth: to that incredible youth which was unconcerned with tanks and bombers, with Fifth Columnists and the intentions of Vichy, with defense housing and aerial torpedoes.

This is an illusion not without elements of danger. We think too narrowly of the arts of expression if we think of them as chiefly useful, in war time, for such necessary trivialities as camouflage and posters, parade and the amusement of camps, or for that quaint sentiment and high language which accompany the sale of bonds. Not less than arms and the courage to use arms we need now the continuing presence of that form of civilized living of which the arts are consequence and symbol. These guard our culture, not as remembrances merely of things past, nor yet as parts of some dim-described destiny to be hoped for and striven for, but as forces present and active. Our arts—and especially our arts of music and of architecture—march like our armies beside the spirit of our times, to which they are interpreters.

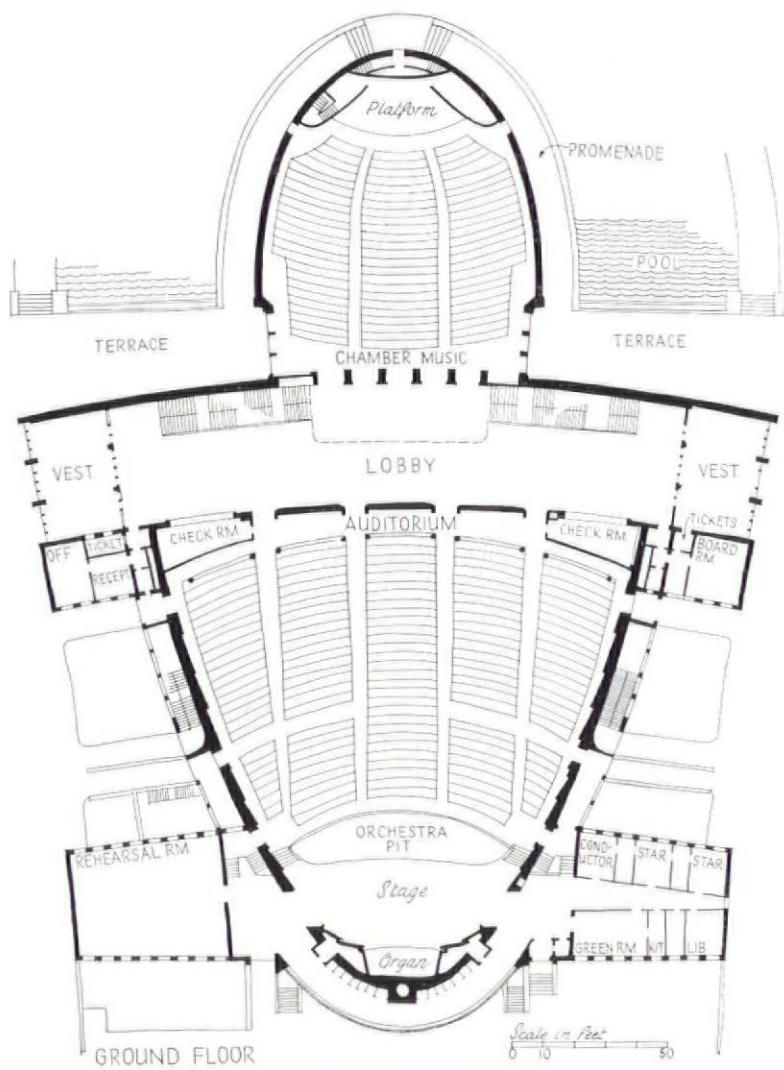
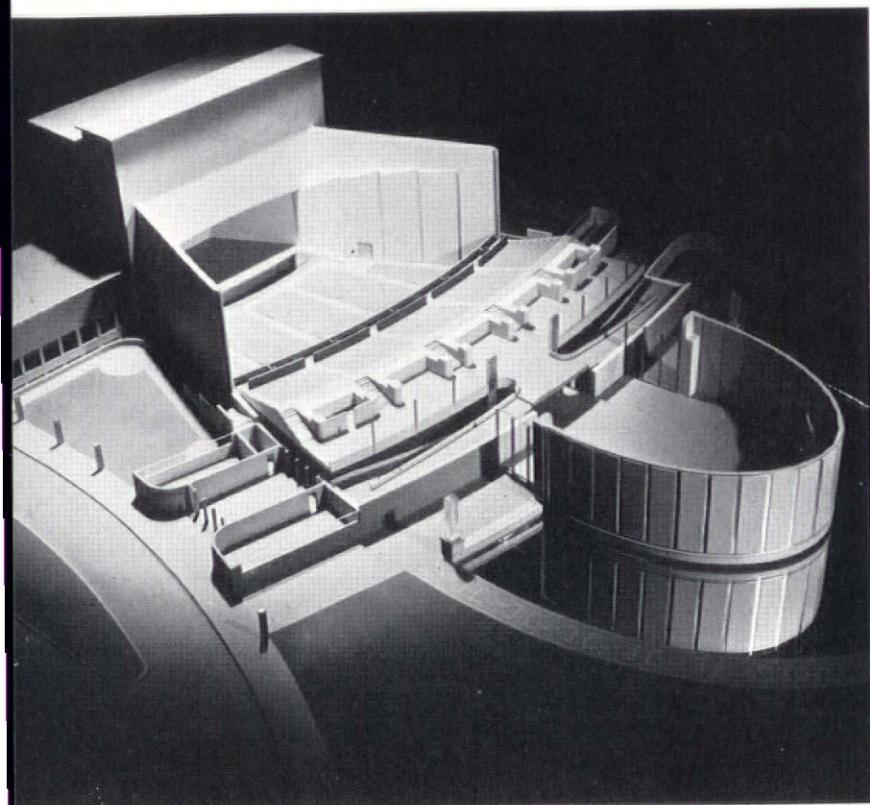
To be persuaded of this one has only to compare the Kleinhans Music Hall with the famous *Symphony Hall*, built only 40 years ago in Boston by McKim, Mead & White. In harmony with the feeling of their day and with European precedent, McKim, Mead & White conceived their design as that of a reception room borrowed from a Baroque palace. A great fragment of space was shaped into a geometric form—the proportion that of two cubes—by parallel walls discreetly encrusted with the learned forms of the Renaissance. Every suggestion of structure or of the utilities was thoroughly blanketed by pilasters, arches, ceiling coffers, amorini, and the high niches peopled, in coy deference to an erudite audience, with that ribald crew, the Gods of Ancient Greece. The galleries at

KLEINHANS MUSIC HALL, BUFFALO, N. Y.



AUDITORIUM





either side, obedient to a law of form, ignore the stage, framed in richly gilded rococo ornament—an arrangement which permits their audiences comfortably to look at each other. A work subtly expressive of that ideal of decorum, established taste, and aristocratic usage which in that day cast a pale and not too remote glamour around the appreciation of Liszt or Beethoven.

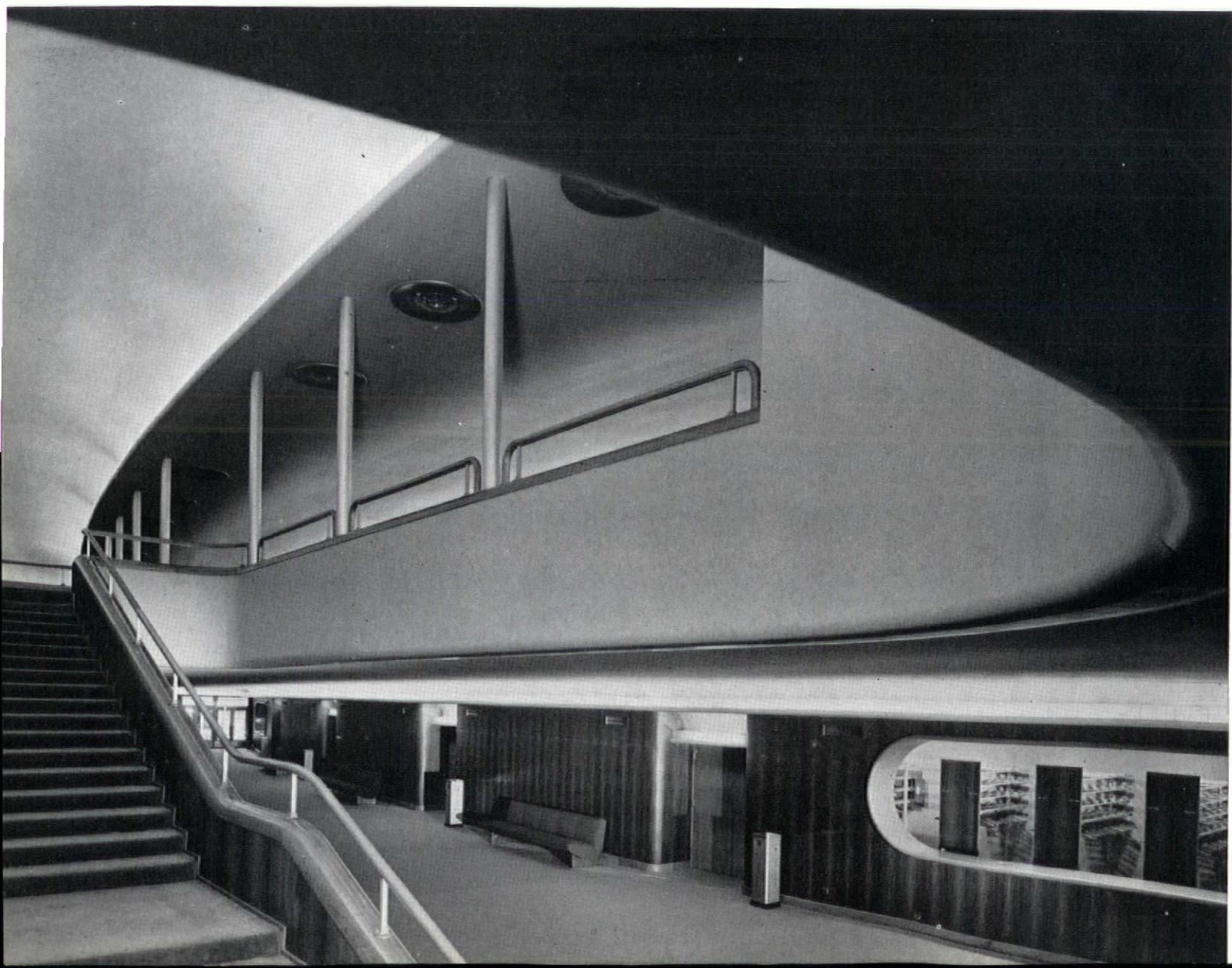
We have discovered since that time a new eloquence of architecture, the sources of which are those necessities that underlie and direct its outward forms. These necessities are the bridge through which the culture of our day is manifest in the forms of buildings. I do not mean that these necessities are not acknowledged in the pattern of Symphony Hall—for it is shaped by intelligence no less than by taste—but rather that these did not enter into the design, in any great measure, as expressive elements. This is not true of the Kleinhans Music Hall; a fact persuasively set forth in that fine model—the one with the roof removed to expose the interior—in which the architect illustrated his design. A Steinway surely: as arduous and precise in structure, as immediate in adaptation of means to end, and with the same technological elegance. And yet no instrument was ever molded more completely by techniques so numerous and so difficult to coordinate. Each element of space or of fabric assumes its individual shape under the pressure and balance of exigencies and relationships having their origin not in fashion or principles of form, but in use.

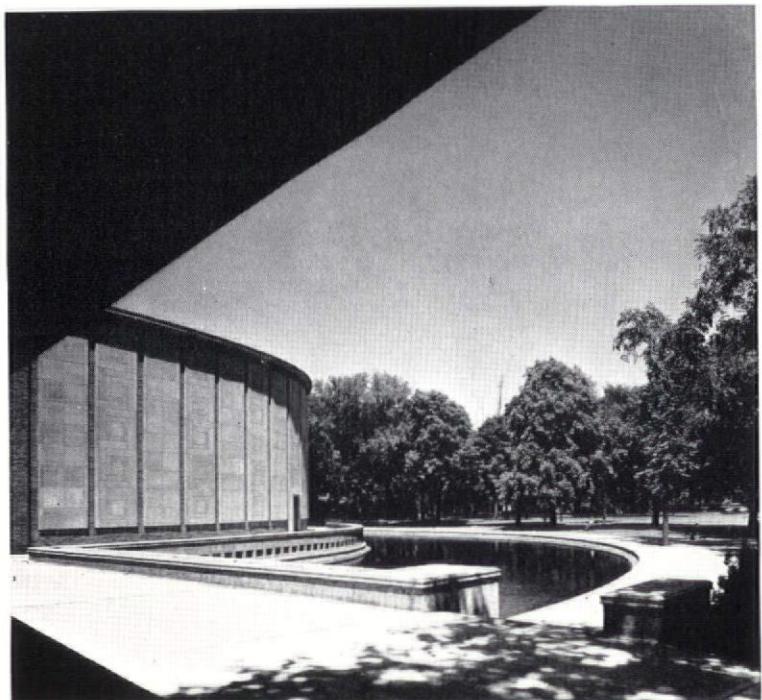
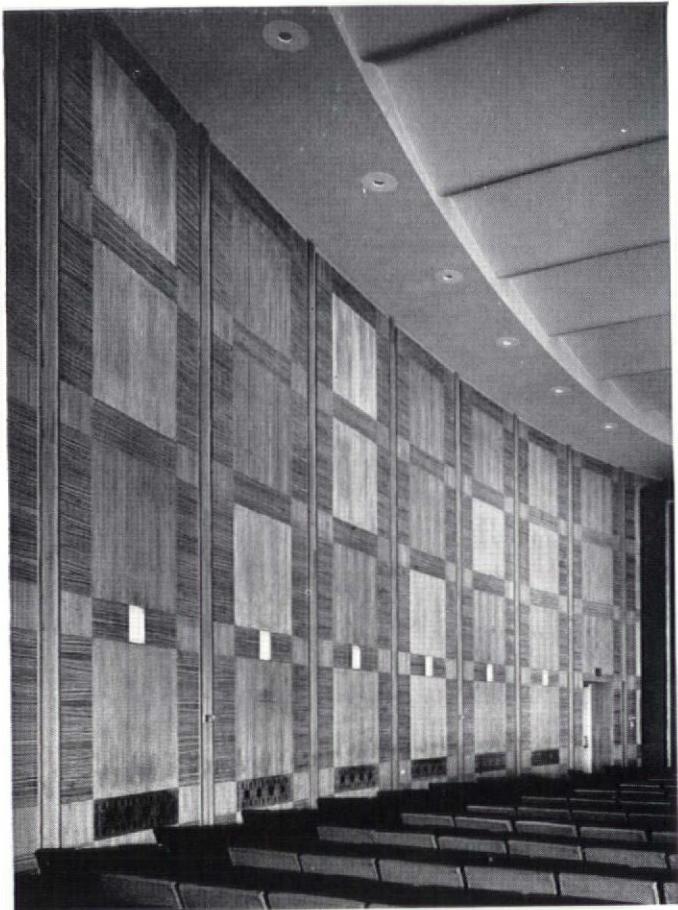
These elements are welded together by the intention which all share. That which is important in architecture is not the strict conformity of each part to its purpose but the way in which all parts are coordinated to give the sense of a single organism. This is the thrilling fact about modern architecture and is the one fact which distinguishes modern architecture from all those which have preceded it since the Gothic era. The Nineteenth Century attained a formal or romantic harmony by the suppression or distortion of whatever techniques were difficult to reconcile with its established ideal; the adjustments and distortions of the modern architect are made, not in the interests of a general harmony of form, but a harmony of energies. That is why one feels in any one of the enclosed spaces of the Kleinhans Music Hall the presence of the others; they explain and answer each other like the several choirs of an orchestra. The foyers, for example, accompany us in long, smooth curves from the streets to the many entrances of the auditorium; the auditorium receives us into its cupped hand and lifts us like great music out of our accustomed



CHAMBER MUSIC

MAIN FOYER





world; the stage addresses us; and the walls listen. Thus each shape becomes an element in a language of shapes, whose meanings are understood and harmonious, being rooted in service.

It is a pity, I think, that these meanings could not have been made more evident on the exterior forms of the building. These do not, it seems to me, fulfill all the promise of the model. They are over-simplified and too static: I should like to lift the roof, as in a grand piano, so that there should be revealed more clearly the beautiful mechanism inside. The movement and murmur of life in the foyer and stairs, for example, is certainly not exhibited in that quiet and solid slab of masonry which envelops them; nor is the intricacy and nice balance of the steel framework in stairway and gallery even hinted at. The purpose of that circular form which clings to the wall behind it, as the apse of a Romanesque abbey to the sheer wall of its transept, is not explained; I should have preferred a functional form, even at some cost of simplicity and elegance. I am surprised that such weight and firm geometry should appear in one building beside the open, light and flexible entrance features, where steel is dramatically confessed in wide spacing and the unsupported overhang of the thin roof, and where the long, smooth horizontals, the flow of space in and out of the interiors, suggest so clearly the going and coming of audiences.

This defeat of an organic unity is not compensated for by that warmth in texture and color, that perfection in detail, that serene candor which, continued here, have always sustained the great and just renown of Eliel Saarinen. I find, for example, in that semicircular basin which surrounds the smaller concert hall a reflection, not so much of the concert hall, as of Versailles. A strangely aristocratic concept, as if the building were placed in some great formal park denied to the public. The development of the surfaces of this smaller hall succeed obviously in giving the work a greater variety and interest but I am inclined to think that this variety is added at too great a cost. There is something precious about these careful patternings; something not explained by any consciousness of interior purpose. I am not one of those who believe that surfaces must be hard, white, and mechanical. I would admit shadow, modeling and color, provided that these should be prompted by something inherent in the nature of the program, of which they should form a part. If this provenance exists in the Kleinhans Music Hall, it has not been made clear.

If I had my way, ~~the~~ in America should Kleinhans Music Hall, ~~make~~ ~~more~~ argument to the idea of music as popular solace and enlightenment—an act of faith made express and visible.

KLEINHANS MUSIC HALL F. J. & W. A. KIDD, ARCHITECTS ELIEL SAARINEN, ASSOCIATE

THE ACOUSTICAL DESIGN

C. C. Potwin Acoustical Consultant, Electrical Research Products, Inc.

The control of sound was a basic engineering requirement, and the Kleinhans Music Hall is an outstanding example of the application of modern acoustical principles in design. It shows that forms which are beneficial to the distribution and reception of sound, when developed in the hands of creative and far-seeing architects, become true expressions of purpose and have unlimited esthetic possibilities.

The acoustical requirements involved in the design of the Music Hall may be summed up as follows:

A. A large auditorium seating about 3,000, in which presentations would range from a large symphony orchestra to soloists, lectures and sound motion pictures.

B. A small auditorium seating about 800, used primarily for chamber music, small choruses and soloists.

C. Both auditoriums to be closely related in plan, but well isolated acoustically.

D. An orchestra practice room, small in size, yet having acoustical properties simulating those of the main auditorium.

The acoustical factors affecting the development of the basic architectural forms were:

1. The desirable ratio of proportions of the floor plan for each auditorium. (Proportions in both rooms are 1:1.3).

2. The proper cubic foot volume per person, as dictated by the purposes for which the rooms would be used. (Volumes are 230 cu. ft. per person in the large auditorium, 210 in the smaller).

3. The relation of seating areas to the stage, for hearing as well as sight.

4. The arrangement of the main lobby with regard to noise transmission from one auditorium to the other.

The main auditorium has a fixed music shell shaped to distribute sound evenly over the audience area. The large ceiling and the underside of the balcony are both shaped to direct the sound in full volume to the rear seats. Comparatively little absorbing material is used, surfaces consisting mainly of hard plaster, plywood, and perforated Flexwood. Elimination of tone distortion and irregular sound distribution is accomplished by the shaping of wall and ceiling surfaces, and by irregularly spaced bracing where plywood is used. In the small auditorium the use of materials is roughly similar.

In the rehearsal room, through the strategic placing of wall and ceiling surfaces, and with the use of small areas of absorbing material irregularly distributed, it has been possible to create a design which gives the orchestra members a sensation of spaciousness for sound similar to that experienced in the main auditorium.

CONSTRUCTION OUTLINE

STRUCTURE: Exterior walls—solid brick and bearing face brick; inside—tile. Stone trim—Breen Stone & Marble Co. Columns—steel. Floor construction—concrete slab.

INSULATION: Roofs—Celotex Corp.

WINDOWS: Sash—metal, Bogert & Carrolough Co. Glass blocks—Pittsburgh-Corning Corp.

STAIRS AND ELEVATORS: Stairs—concrete, carpet covered. Elevators (freight)—Otis Elevator Co.; (stage)—Warsaw Elevator Co.

FLOOR COVERINGS: Main auditorium and lobby—carpet, Mohawk Carpet Mills, Inc. Chamber music room—oak parquet.

WALL COVERINGS: Flexwood, U. S. Plywood Co.

FURNISHINGS: Auditorium seats—Ideal Seating Co.

METAL TRIM: Exterior doors—aluminum, Dahlstrom Metallic Door Co. Toilet partitions—Flush Metal Partition Corp.

HARDWARE: By Yale & Towne Mfg. Co.

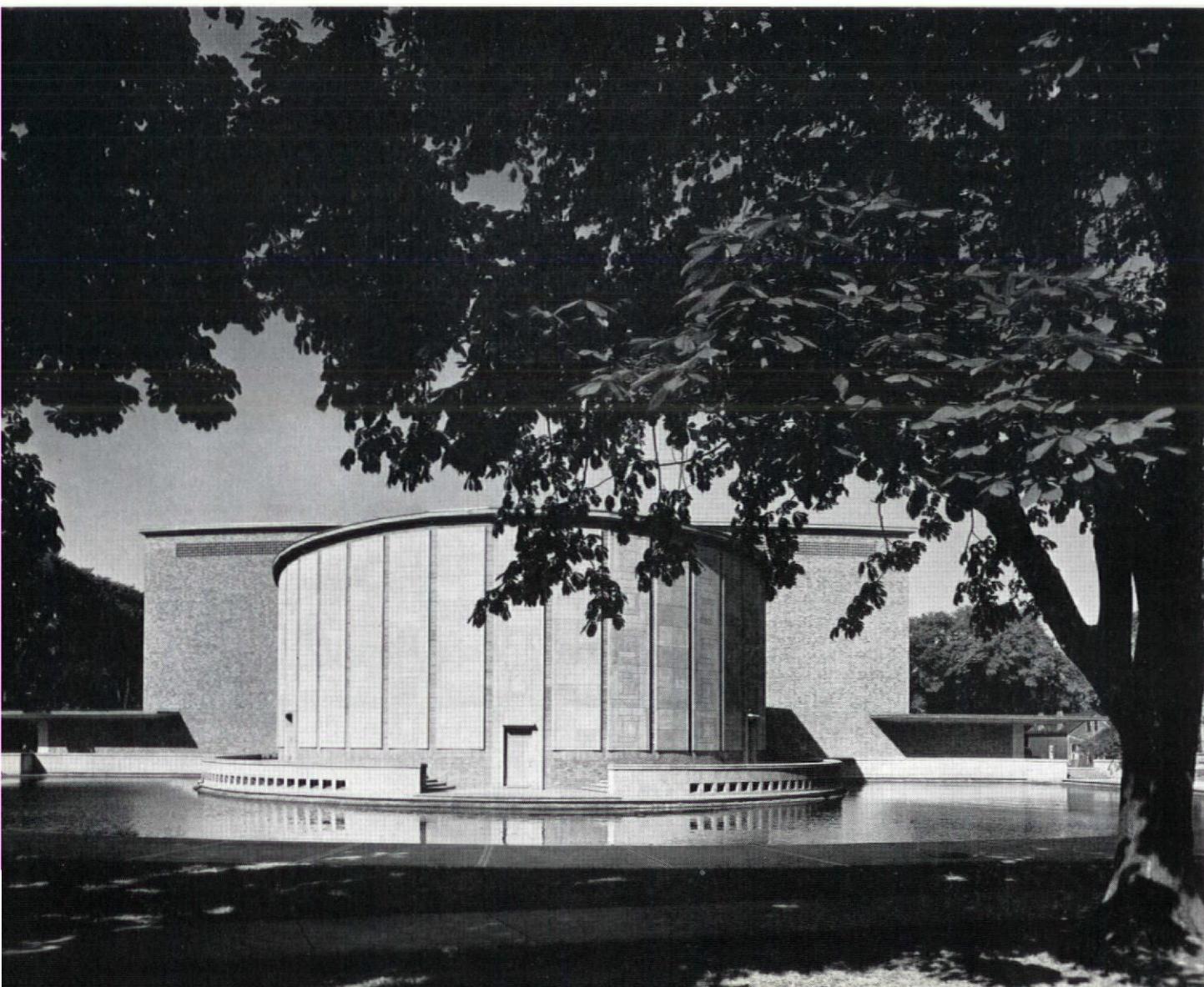
PLUMBING FIXTURES: W. A. Case & Son Mfg. Co.

HEATING AND AIR CONDITIONING:

Vacuum return system, filtering, humidifying and cooling, Buffalo Forge Co.

Boiler: National Radiator Co. Radiators—U. S. Radiator Co. Regulators—Minneapolis-Honeywell Regulator Co. Water heater—Ruud Mfg. Co. Vacuum pumps—C. A. Dunham Co.

GENERAL CONTRACTOR: M. SHAPIRO & SON CONSTRUCTION CO., INC.



MEDICAL OFFICE, INGLEWOOD, CALIF.

GREGORY AIN, DESIGNER

This small medical building occupies a corner lot in the business district of a small town near Los Angeles. Requirements included the provision of space for a doctor and dentist, with arrangements for easy circulation from the receptionist to the various consulting and treatment rooms. The use of high ribbon windows is especially interesting in this type of building, as they provide excellent working light with privacy and comparative freedom from street noises. The plan has been arranged so that a complete medical suite can be added to the north end of the present medical wing. Cost: \$5,450. Cubage: 12,850.

CONSTRUCTION OUTLINE

FOUNDATIONS: Concrete. Waterproofing—Anti-Hydro Waterproofing Co.

STRUCTURE: Exterior walls—stucco on galvanized mesh over 15 lb. roofing felt, studs; inside—cement plaster or $\frac{1}{4}$ in. Douglas fir 3-ply paneling. Floor construction—cement slab with asphalt-felt membrane, over gravel bed on grade.

ROOF: Covered with aluminum surfaced 90 lb. cap sheet, Eirey Products Co., over 2 layers 15 lb. felt.

SHEET METAL WORK: Flashing—galvanized iron.

INSULATION: Roofs—aluminum foil, Alfol Insulation Co. Sound insulation—Celotex Corp.

WINDOWS: Sash—sugar pine, casement. Glass—double strength, quality A, Libbey-Owens-Ford Glass Co. Screens—In-Vis-O, Disappearing Roller Screen Co.

FLOOR COVERINGS: Asphalt tile, Armstrong Cork Co.

WOOD AND METAL TRIM: Trim—metal. Doors—sugar pine and Douglas fir.

HARDWARE: By Schlage Lock Co. and Vincent Whitney Co.

PAINTS: By Sherwin-Williams Co. and The Reardon Co.

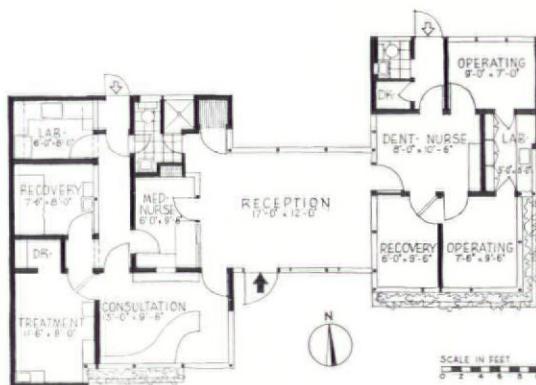
ELECTRICAL INSTALLATION: Switches—Hart & Hegeman.

PLUMBING: Fixtures—Kohler Co. Soil pipes—Cast iron. Hot and cold water pipes—wrought iron. Water heater—General Water Heater Corp.

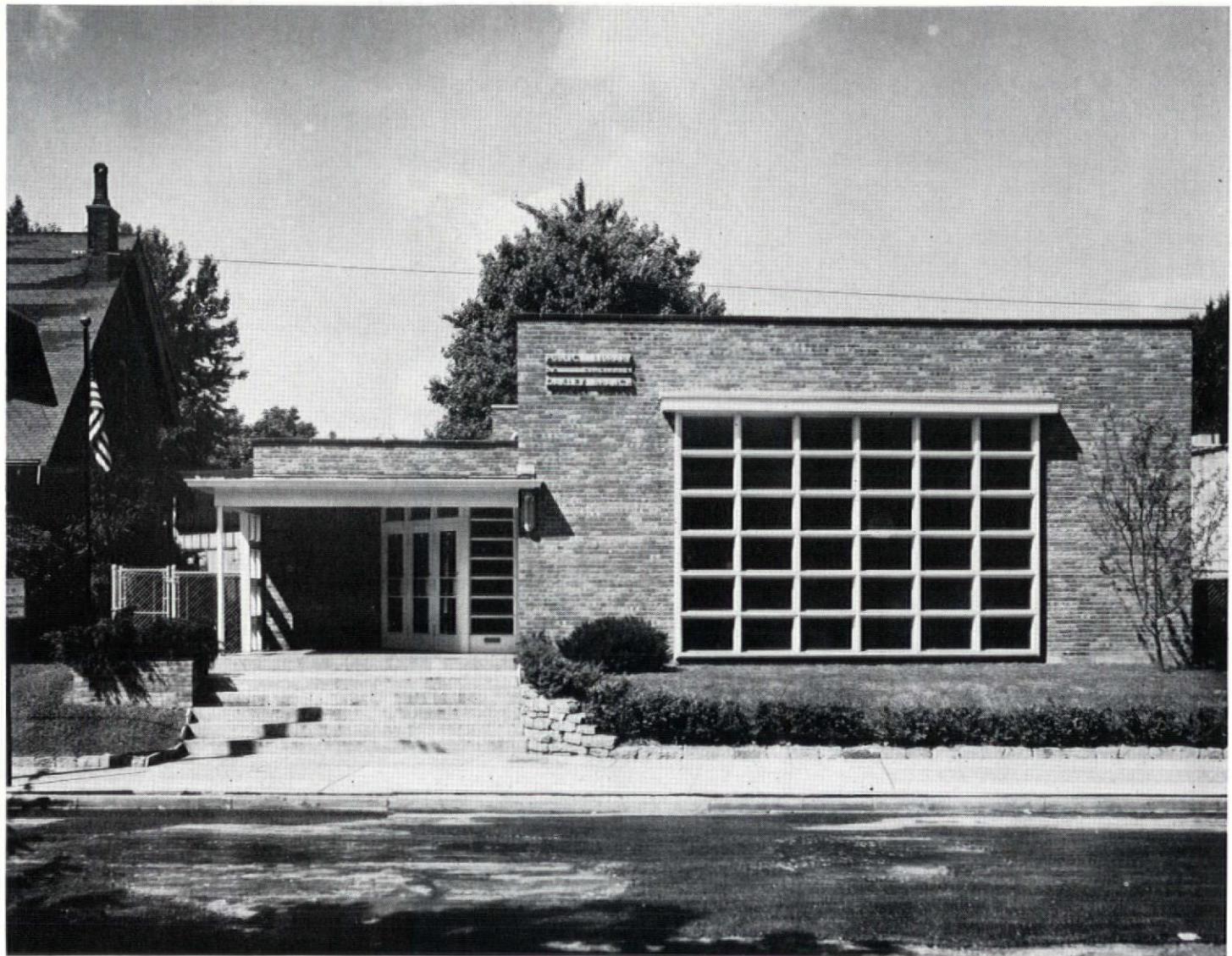
HEATING: Gas-fired unit heaters, The Williams Radiator Co.



Julius Shulman Photos



OAKLEY BRANCH LIBRARY, CINCINNATI, OHIO

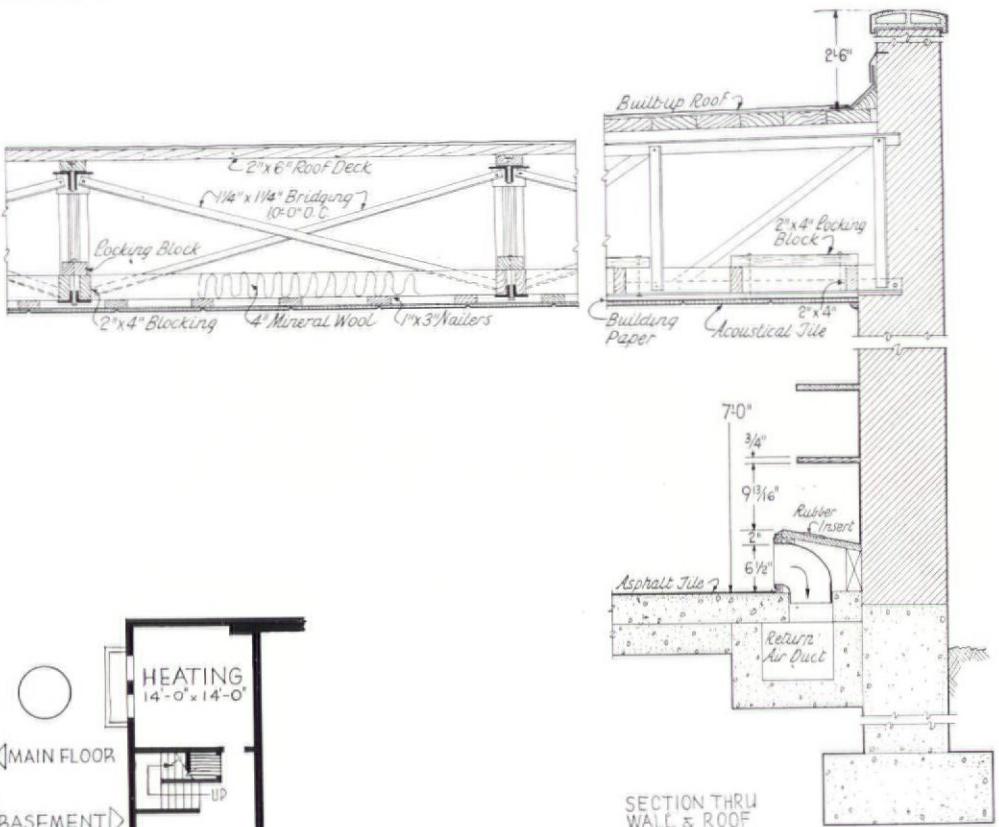
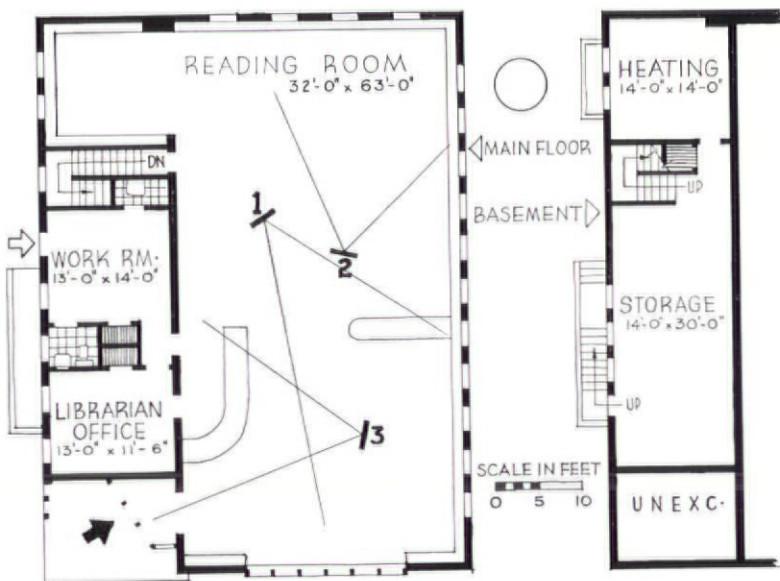


Joseph Ewald Photos

VIEW 1.

The growing tendency to accept a contemporary approach in the design of small buildings put up with public funds is a most encouraging indication of the steadily extending scope of modern architecture. This branch library features a large reading room, lighted mainly by windows over the bookshelves, with the addition of a work room, office, and children's room in the basement. The use of brick in conjunction with wood sash, and the small scale of the various elements are excellent in a structure surrounded by private residences.





CONSTRUCTION OUTLINE

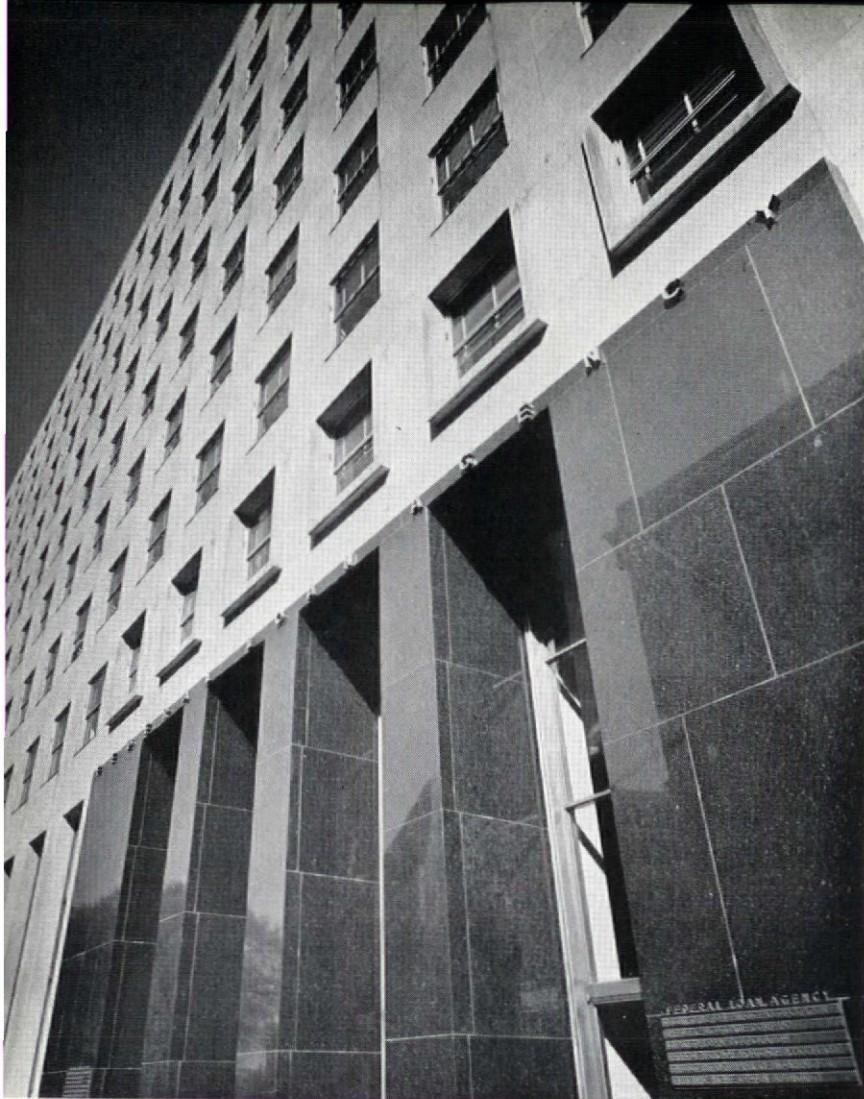
STRUCTURE: Exterior walls—face brick, cinder block, cast stone trim. Interior walls—studs, gum plywood, two sides, Weldbord, U. S. Plywood Corp. Ceiling—Celotex tile and Acousti-Celotex, Celotex Corp. Floors—asphalt tile, Johns-Manville. **ROOF:** Covered with 20-yr. built-up, The Ruberoid Co. **WINDOWS:** Sash—steel casement and projected, Fenestra, Detroit Steel Products Co. Glass—Libbey-Owens-Ford Glass Co. **WOODWORK:** Doors—flush panel, gum, "Sturdibilt," M. & M. Woodworking Co. **LIGHTING FIXTURES:** Chrome, Kurt Versen. **PLUMBING:** Pipes—copper tubing. Fixtures—Crane Co. **HEATING:** Forced warm air, gas fired furnace, June-Aire, American Foundry & Furnace Co.



VIEW 3.

VIEW 2.

FEDERAL LOAN



Ezra Stoller Photos

MAIN LOBBY



One of a number of commercial structures recently erected in Washington for lease to mushrooming government agencies, the Lafayette building follows a trend to be observed in many of the newer public and semi-official buildings. Best illustrated by the new headquarters for the War Department, it consists of an observance of the classic formula with the elimination of the accompanying detail. At its worst the effect is one of a nudity as depressing as the former over-decoration; in this instance the result is a brisk simplicity, which is direct and business-like. The plan shows good provision for outside light in offices that had to be arranged on a difficult site; most progressive of the plan features is the two-level parking garage incorporated in the building. The cost, including a cafeteria and other special equipment required by the tenant, was approximately \$4,620,000. Cubage: 6,451,000.

CONSTRUCTION OUTLINE

STRUCTURE: Exterior walls—limestone backed with brick; inside—terra cotta tile. Tile arch for floors. Structural steel—Fort Pitt Bridge Co.

ROOF: Covered with tar and gravel. Terrace roof—quarry tile over 2 in. cork.

SOUND INSULATION: Ceilings—Stucoustic acoustic plaster, California Stucco Co. or Celotex block, Celotex Corp.

WINDOWS: Sash—bronze casement, General Bronze Corp., and steel double hung, Campbell Metal Window Div., Truscon Steel Co. Glass— $\frac{1}{4}$ in. polished plate. Shutters—Cornell Iron Works.

ELEVATORS: Twelve fully automatic gearless, traction passenger and two freight, Otis Elevator Co.

FLOOR COVERINGS: General offices—linoleum. Executive offices—carpet. Corridors—terrazzo. Main lobby—Montana Travertine.

WALL COVERINGS: Main board room—bleached walnut paneling; small board room—Appalachian oak.

DOORS: Interior doors—bleached walnut, flush panel type. Exterior doors—bronze. Garage doors—stainless steel overhead, electrically operated.

HARDWARE: By Yale & Towne Mfg. Co.

ELECTRICAL INSTALLATION: Underfloor duct system of wiring, Fibre Conduit Co. Lighting fixtures—Kurt Versen.

PLUMBING: Soil and waste pipes—cast iron, Nolan Co. Vents—steel. Hot and cold water pipes—red brass, Revere Copper & Brass Co. Fixtures—Crane Co.

Kitchen equipment (cafeteria)—S. Blickman, Inc.

HEATING AND AIR CONDITIONING: Hot water system, humidifying, dehumidifying, cooling and filtering. Fans—B. F. Sturtevant Co. Centrifugal compressors and window units—Carrier Corp.

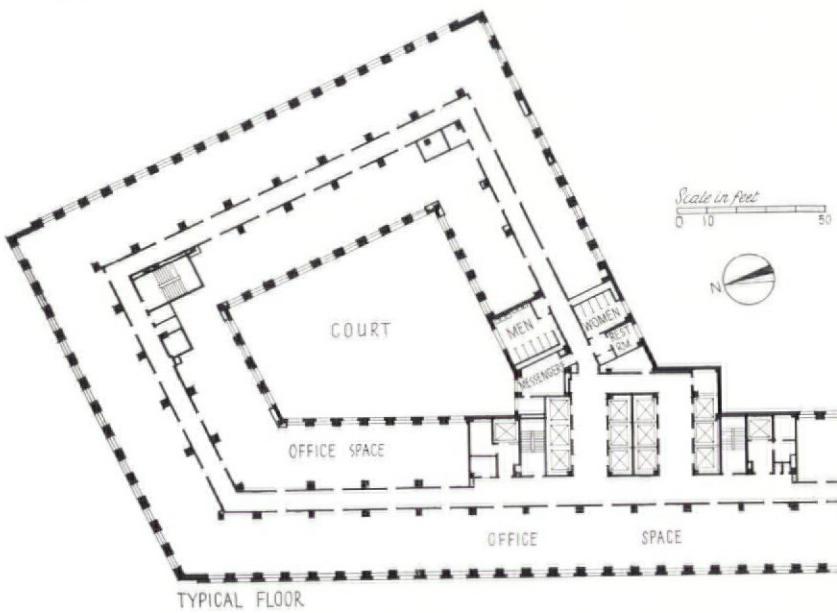
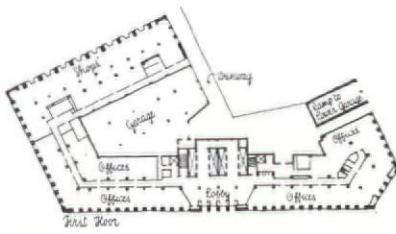
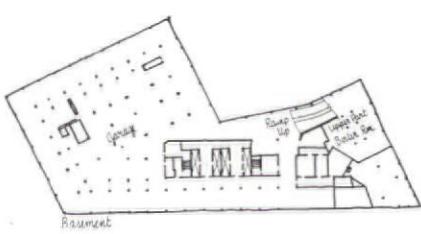
SPECIAL EQUIPMENT: Incinerator—oil fired, Morse Boulger Destructor Co. Watchman's system—60 stations, Holtzer-Cabot Co.

GENERAL CONTRACTOR:
THOMPSON-STARRETT COMPANY, INC.

AGENCY BUILDING, WASHINGTON, D. C.

A. R. CLAS, ARCHITECT

HOLABIRD AND ROOT, ASSOCIATE ARCHITECTS



FEDERAL LOAN AGENCY BUILDING

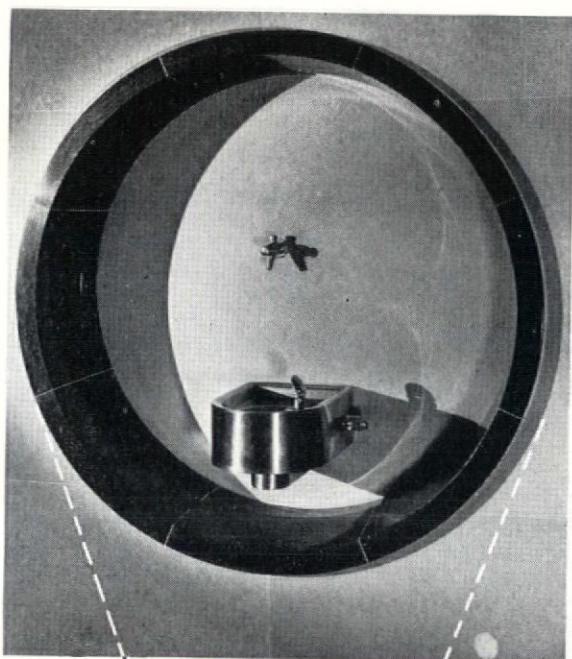
A. R. CLAS, ARCHITECT

HOLABIRD AND ROOT, ASSOCIATES



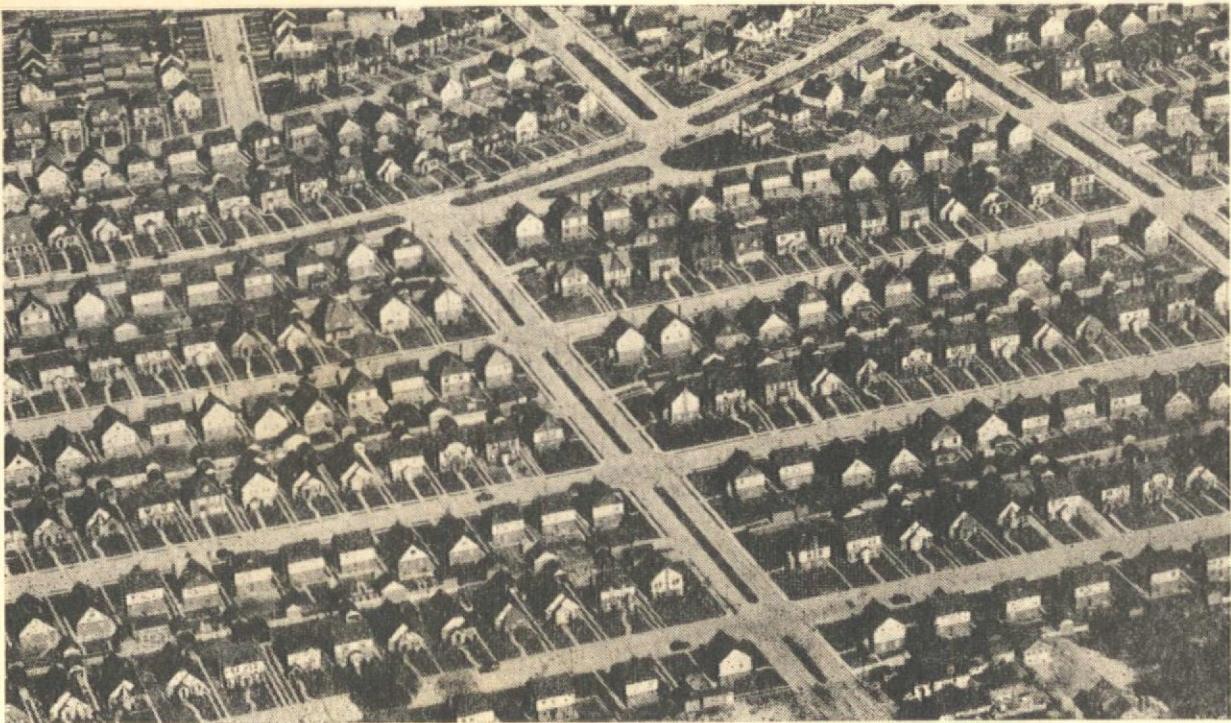
BOARD ROOM

Illustrations show the board room, a handsome and dignified interior in wood, and the elevator lobby on a typical floor. Details have been especially well handled: changing the location of the car direction signals from the usual position over the doors is typical of the many small changes contributing to better organization of interior design.



TYPICAL ELEVATOR LOBBY





THE ARCHITECTURAL FORUM

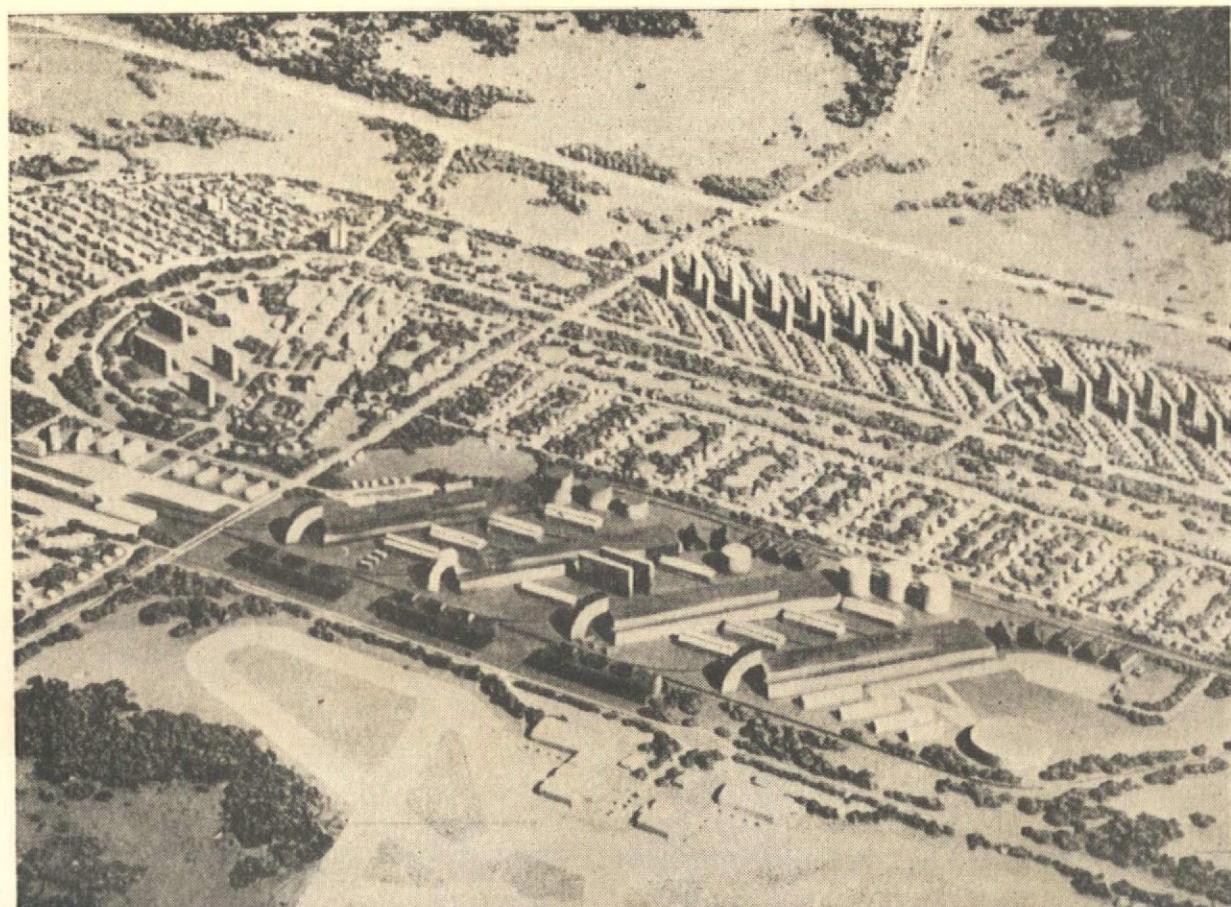
announces

P O S T - W A R P A T T E R N

a series of studies of the major problems which Building must meet in the post-war period. In developing this program the Editors will be advised by a panel of distinguished collaborators.

The first article in this series will appear in AUGUST.

Office of Norman Bel Geddes, Richard Garrison Photo



SUBJECTS TO BE COVERED IN THE POST-WAR PATTERN ARTICLES

Building must work to a plan—each house to its neighbors, the neighborhood to its community, the community to its region and ultimately the regions to the nation.

It must adopt rational standardization to gain economies.

It must further integrate and enlarge operations to bring about a responsible leadership and a more intelligent collaboration of those who plan, those who build, those who finance, those who deal in land, and those who make and supply materials and equipment.

It must solve the problem of the really low cost house, not by producing a stripped down, compressed shell, but by affording complete modern living amenities at decreasing cost of purchase and maintenance or of rent.

It must remove every unnatural restraint practiced by any branch of Building. This purge must include obsolete codes and ideas quite as completely as illegal practices.

It must face the fact that Building continues low in public opinion, and carry out a large-scale program of constructing a new and favorable national concept of Building. Building must not only live right but must make sure the public knows it does.

It must expose the entire building process to intensive, broadminded research covering not only technology but thorough exploration of the major factors which will improve the quality of its services to the public and the stability of Building itself.

It must work for an effective control of land use. Zoning ordinances must be made adequate.

It must work for a rationalization of taxation to attract capital interested in a secure, reasonable return.

It must encourage the further study of planned public works as a means of shockproofing depressions and providing continuous employment of men, materials and money.

It must recognize that technological advances will come more rapidly in the future and it must therefore provide lower cost and more flexible buildings. The approach must gradually shift to the most modern standards attainable. Building must advocate what industry has long practiced—a willingness to depreciate structures before the period of physical obsolescence has been reached. The facilities, existing and to be created, recently described by the President as "Democracy's Arsenal," may be converted to constructive post-war use in this program.

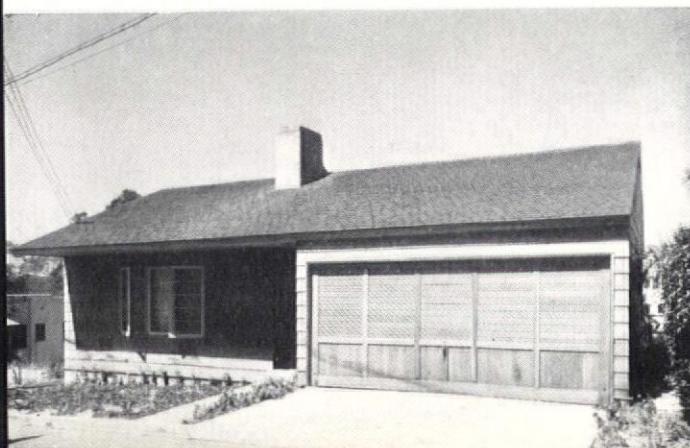
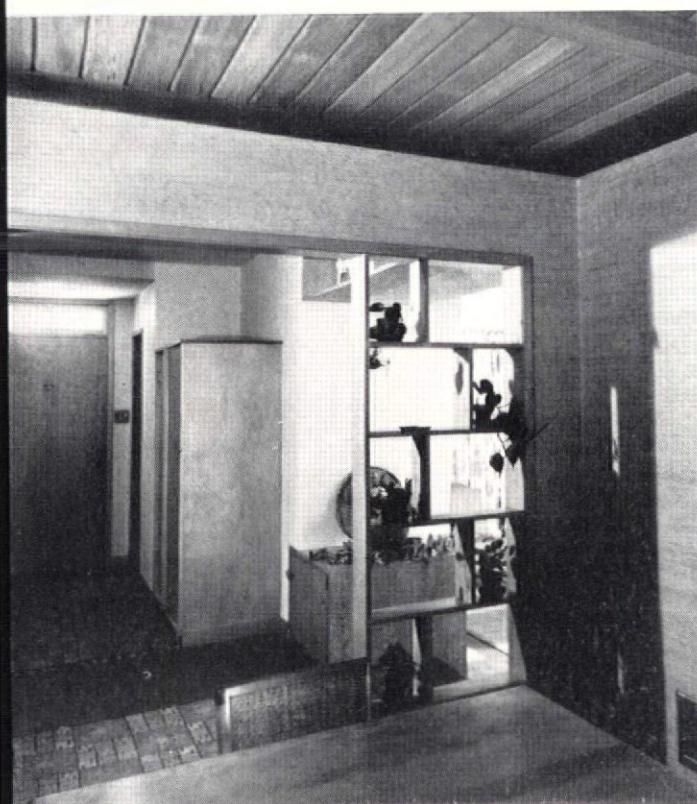
It must rationalize its labor problem. Building labor needs a higher annual wage but a lower hourly rate. Plans which meet this objective and which eliminate jurisdictional strikes and similar costly restraints must be evolved. Opposition is great, but so would be the gains.

It must redefine its relations with Government. The present tendency of Government to absorb various building functions must be converted to a policy of effective collaboration between Government and private enterprise, and the creation of a national atmosphere in which private enterprise will reach its maximum useful capacity.

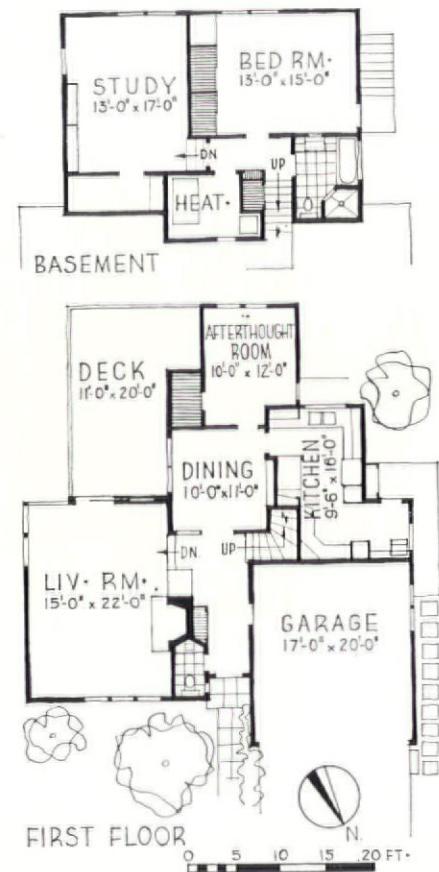
The first article of this series
will appear in the August Issue of
THE ARCHITECTURAL FORUM

HOUSES

LOS ANGELES, CALIF. DOUGLAS McFARLAND, DESIGNER



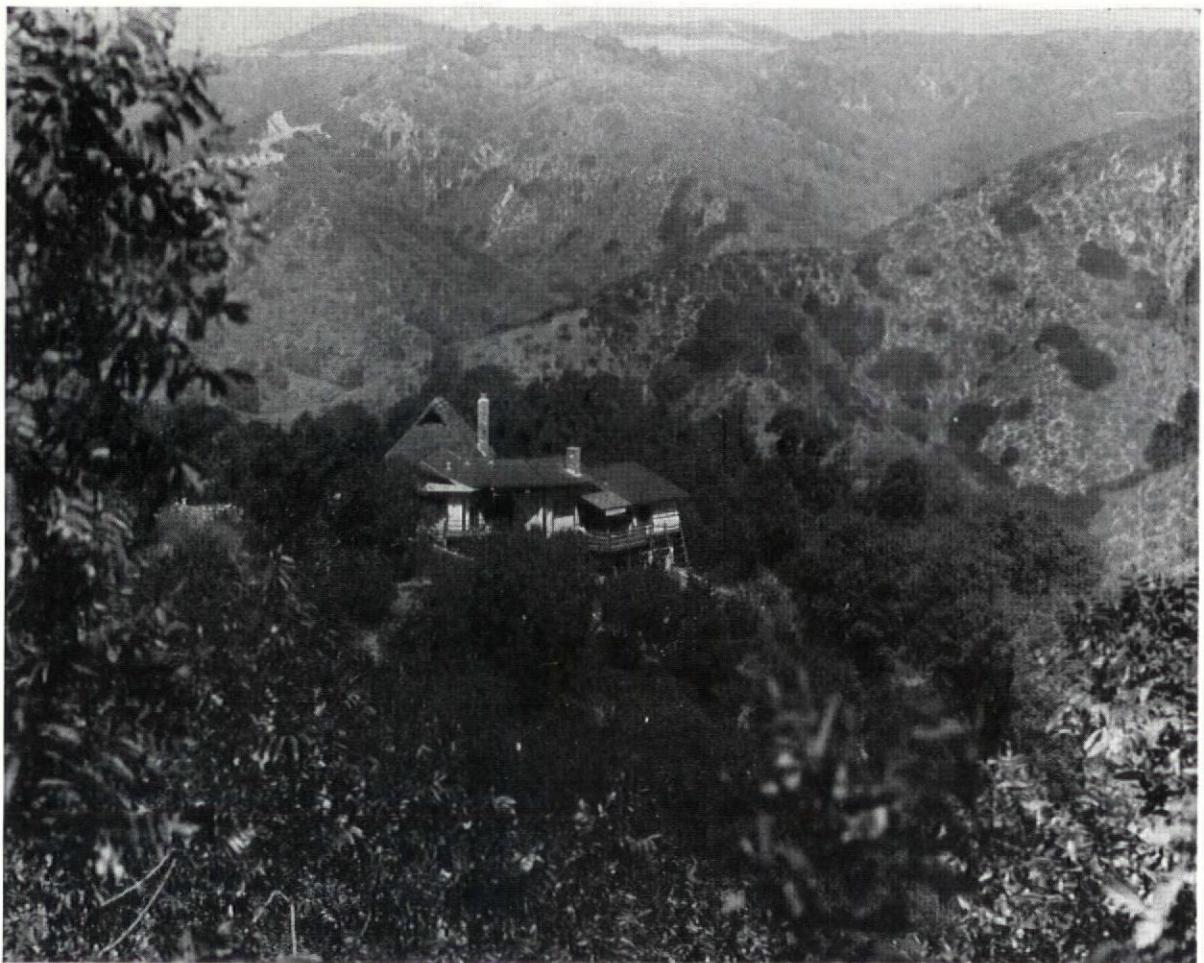
Ralph E. Knowles Photos



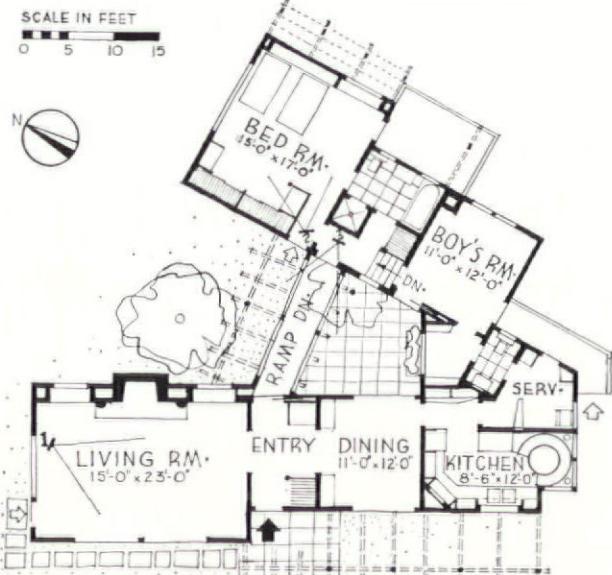
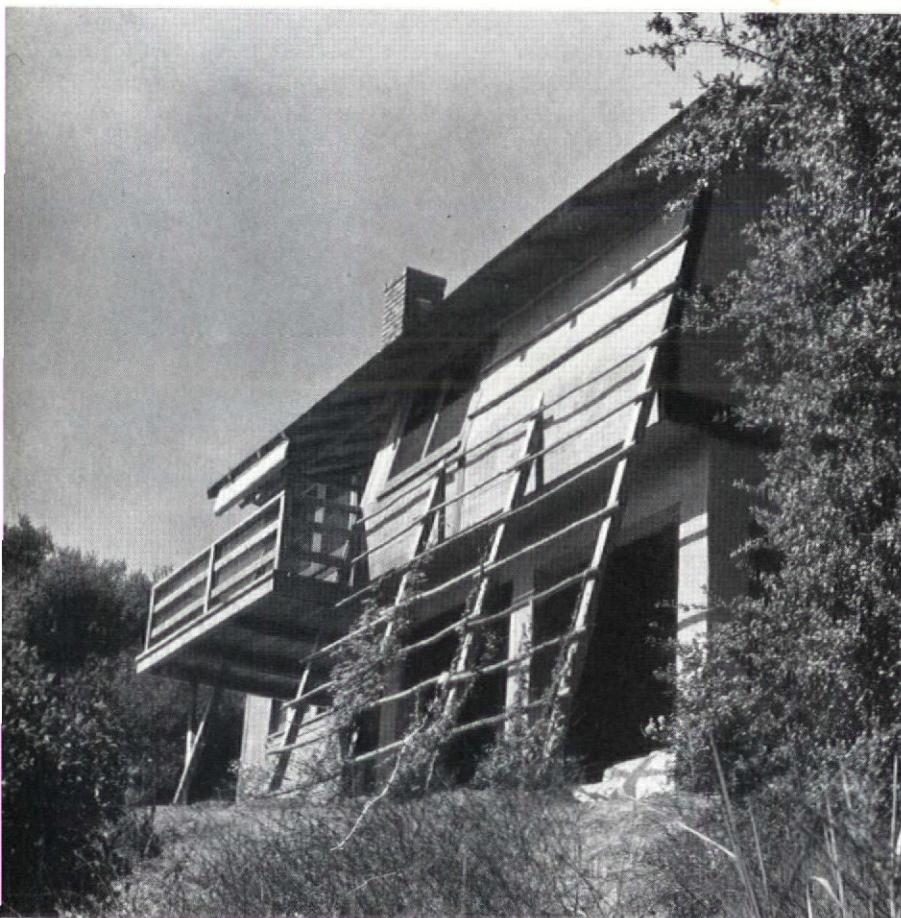
Solutions for the steep hillside lot are generally interesting, and this is no exception. The designer took advantage of the slope to place the bedroom, study, heater room and bath under the main floor with an open deck over a portion of the study. The "afterthought room" is what the name indicates: waste attic space recovered after construction began. An unassuming treatment of exterior and interiors is in character with the modesty of the owner's requirements. Area: 1,730 sq. ft. (garage at half); Cost: approximately \$6,200.



TWO BEDROOMS, ONE BATH, SEPARATE DINING ROOM, PATIO



Ralph E. Knowles Photos



There are interesting contrasts between this and the preceding example, which was done by the same designer, both in general character and technique of planning. Most interesting here is the manner in which the rooms are strung in a loop around a tiny court, partly to take advantage of the outlook but chiefly to conform to a limited site. The ramp from entry to bedrooms is a pleasant and practical device for changing levels without stairs. Other interesting features are the sloping windows, removable sliding doors, and the screened-over patio which serves admirably as a child's play yard. The interiors show an agreeable combination of warmth and simplicity. Cost: about \$10,000.

CONSTRUCTION OUTLINE

STRUCTURE: Exterior walls — frame, plaster and redwood. Rockwool insulation, U. S. Gypsum Co.

WINDOWS: Glass—Pennvernon, double strength, Pittsburgh Plate Glass Co.

FLOOR COVERINGS: Main rooms—oak. Kitchen—linoleum, Armstrong Cork Co.

WALL COVERINGS: Main rooms — grass cloth or Douglas fir plywood.

Kitchen and bathrooms—Sanitas, Standard Coated Textile Products Co.

KITCHEN EQUIPMENT: Range, refrigerator and water heater—Hot Point, Edison General Electric Appliance Corp.

PLUMBING: Pipes: Copper tubing—Revere Copper & Brass, Inc.; galvanized iron—Armco, American Rolling Mill Co.

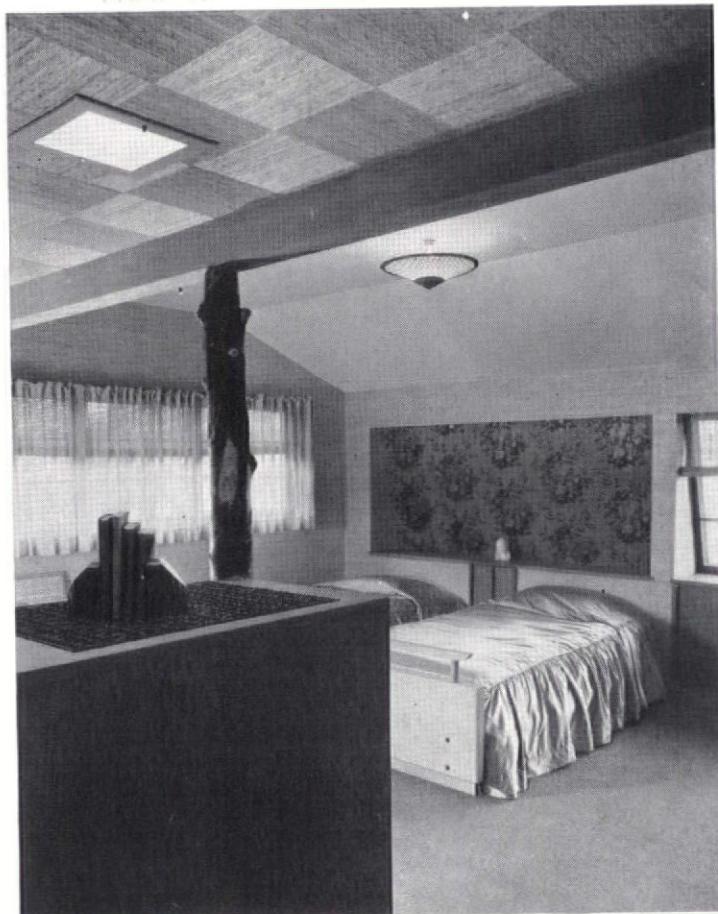
Fixtures—Crane Co.

HEATING: Furnace and oil burner—Gar Wood Industries.



VIEW 1.

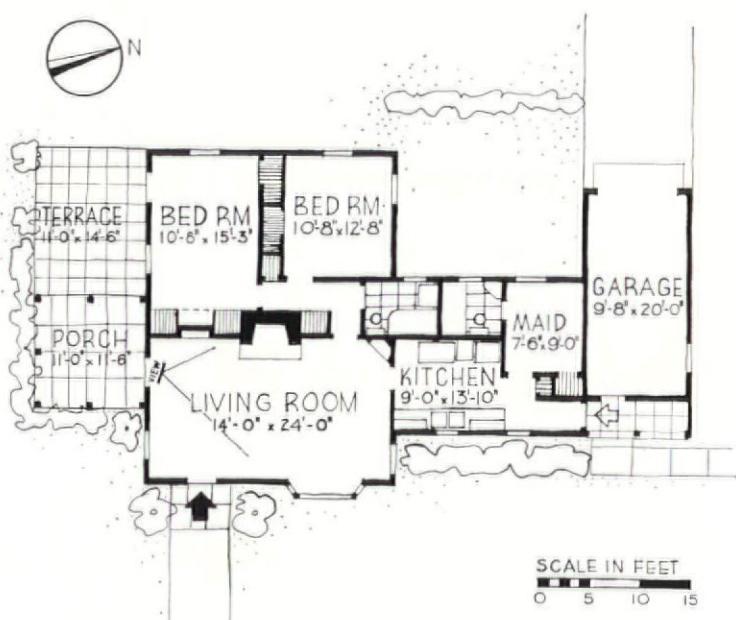
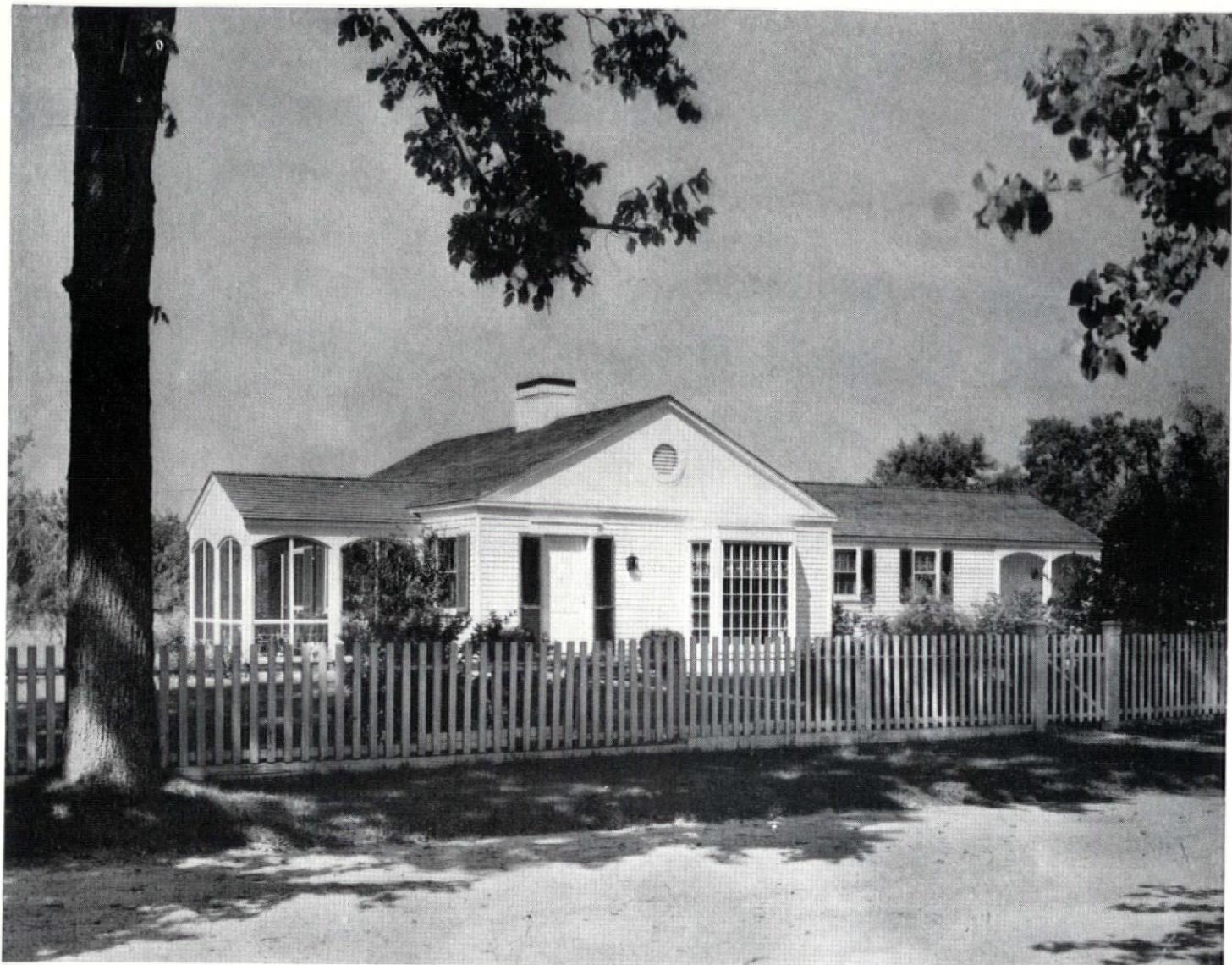
VIEW 2.



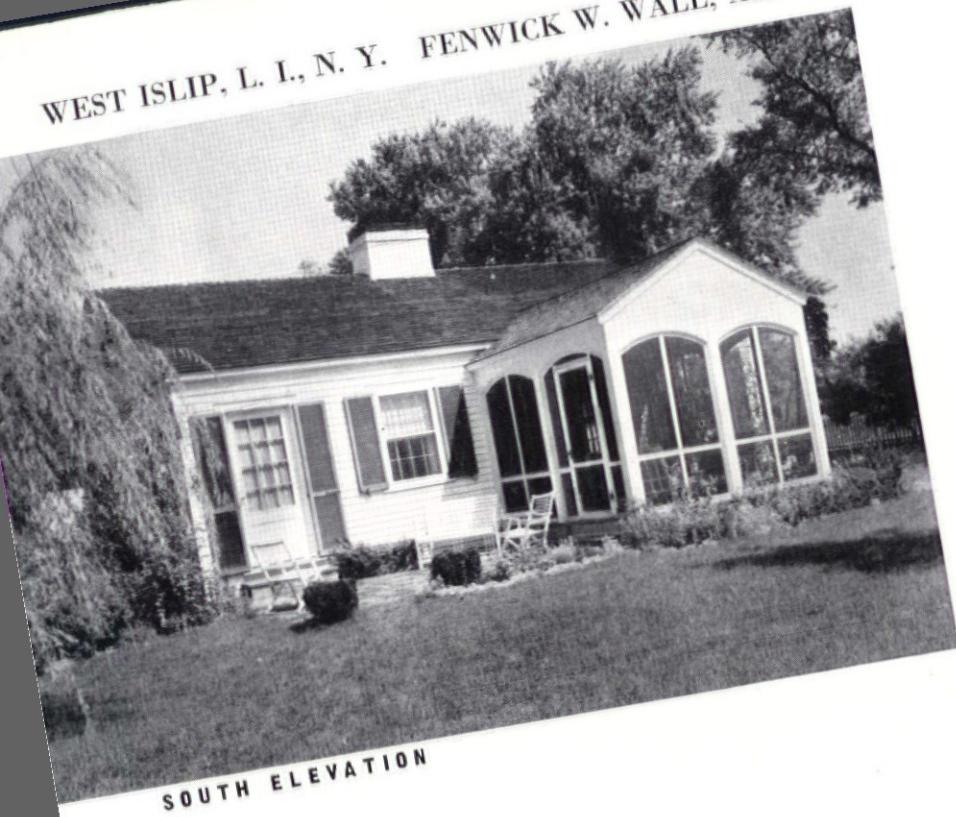
VIEW 3.



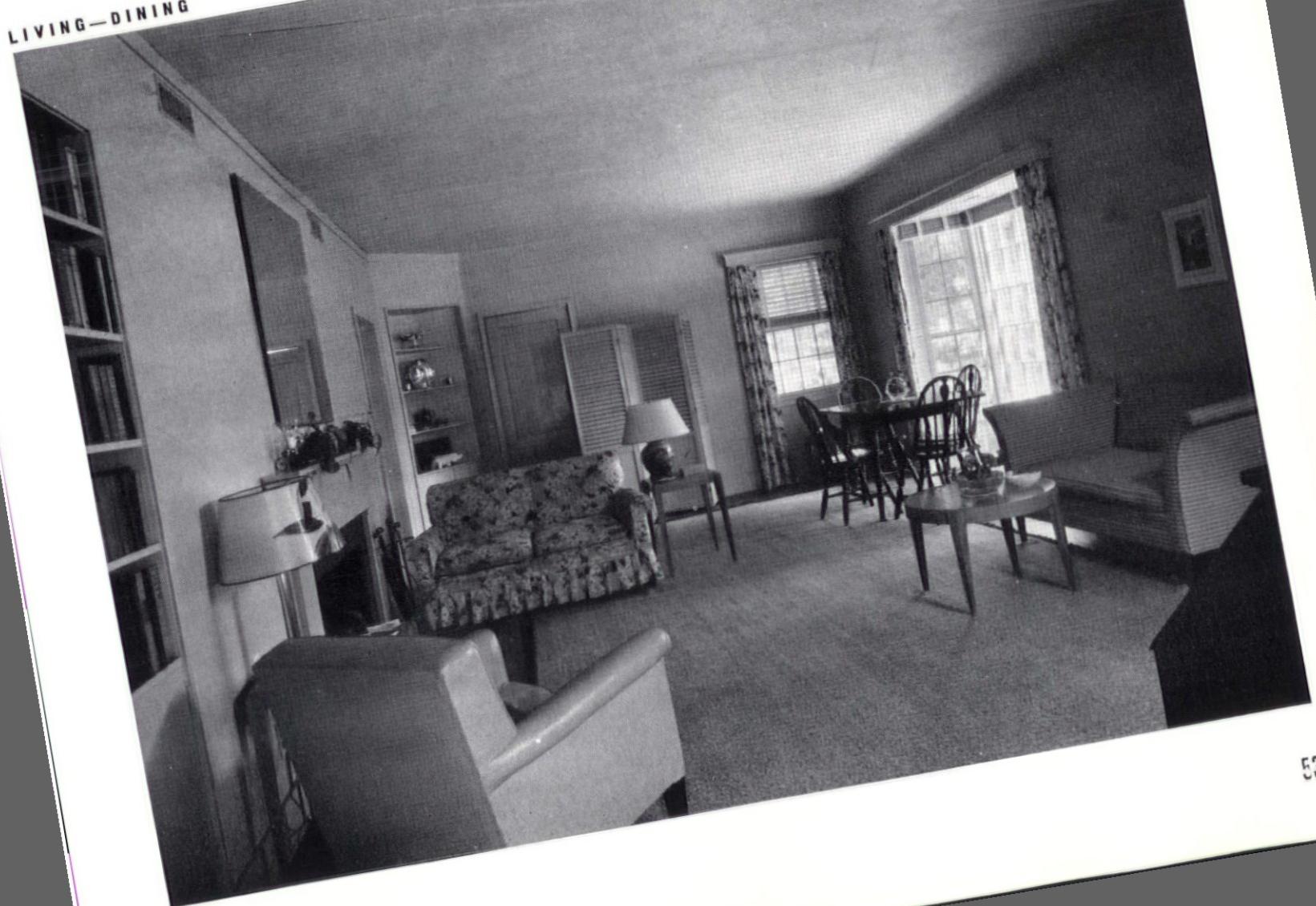
TWO BEDROOMS, BATH, SERVANT'S ROOM AND BATH, NO BASEMENT



WEST ISLIP, L. I., N. Y. FENWICK W. WALL, ARCHITECT



SOUTH ELEVATION

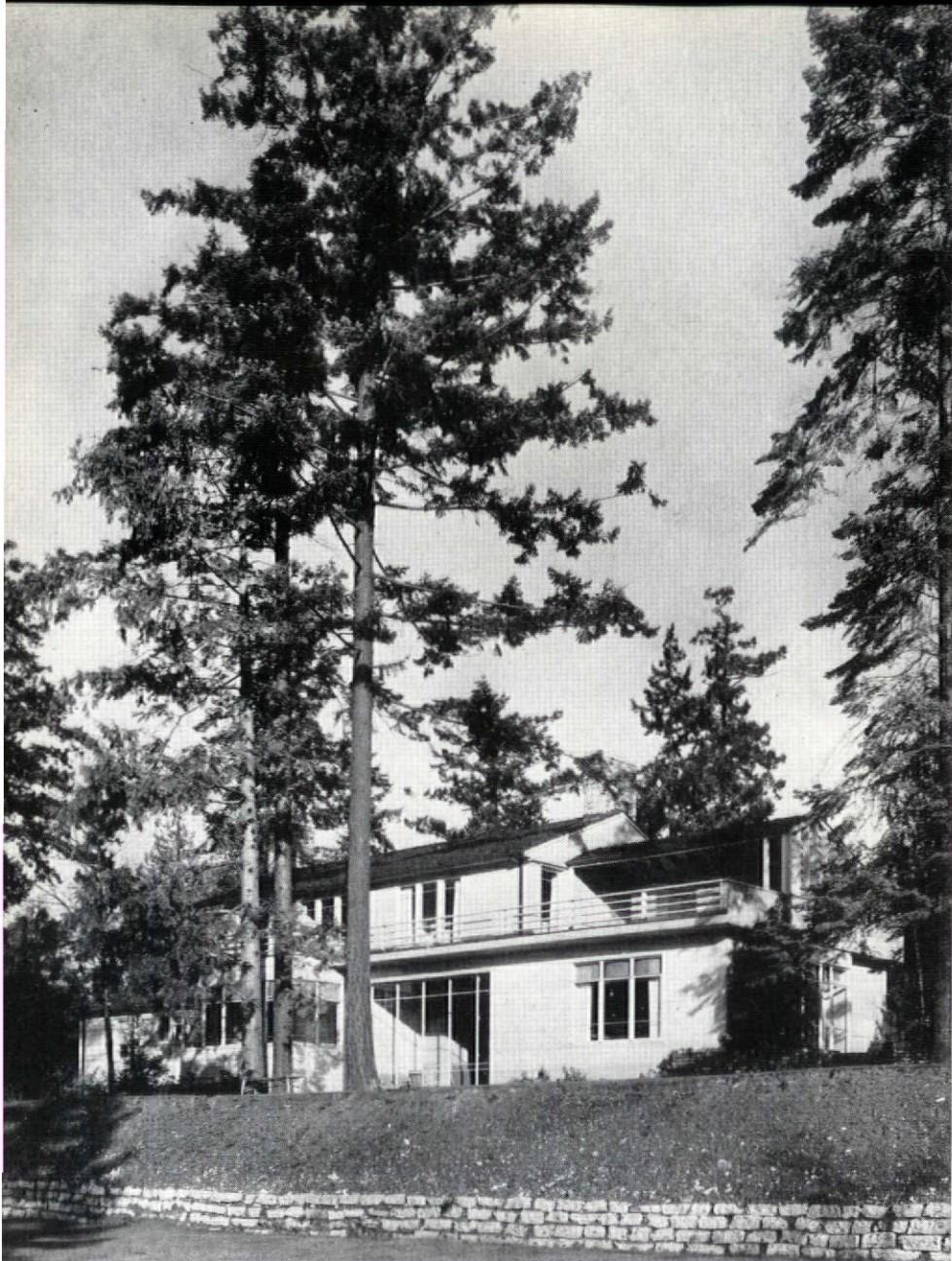


LIVING-DINING
JULY 1941

In a number of respects this small house departs from the conventional plan pattern. Bedrooms and living room form a solid block, with the former facing the rear garden; there is no attempt whatever, as the interior view indicates, to create any separation between dining and living areas; and the front vestibule, a standard feature in this climate, has been omitted. The necessity of using the living room for through circulation to the bedrooms is probably more of a disadvantage in theory than in fact. Cost: \$6,880. Cubage: 18,098.

CONSTRUCTION OUTLINE

STRUCTURE: Exterior walls—studs and wood sheathing; inside—Homasote, Agasote Millboard Co. and Sheetrock, U. S. Gypsum Co.
ROOF: Covered with cedar shingles.
SHEET METAL WORK: Flashing—16 oz. copper.
INSULATION: Attic—Reynolds Metals Co.
WINDOWS: Sash—double hung. Glass—single strength, quality A, Libbey-Owens-Ford Glass Co.
FLOOR COVERINGS: Main rooms — red oak. Kitchen and bathrooms—linoleum.
HARDWARE: By P. & F. Corbin.
ELECTRICAL INSTALLATION: Switches—General Electric Co. Fixtures—Lightolier Co.
KITCHEN EQUIPMENT: Range — Smoothtop, Electrolux, Servel, Inc. Water heater—Crane Co.
BATHROOM EQUIPMENT: By American Radiator. Standard Sanitary Corp.
PLUMBING: Soil pipes—cast iron. Hot and cold water pipes—brass.



**FOUR BEDROOMS, NURSERY,
LANAI, SEPARATE DINING ROOM**

A good example of the most recent contemporary residential work in the Pacific Northwest, where, as in California, the generally accepted elements of modern design are being given a distinctly regional character. The house shows quite dissimilar exterior treatments at the front and rear, the former presenting blank walls and small windows to the street and the latter, generous glass areas opening to the view. The lanai, whose name suggests the literary as well as architectural influence of Hawaii on West Coast living habits, is a very useful area which serves equally well as an open porch or enclosed room. In the plan, which is well arranged for comfortable living, it serves as a link between garden, living room and hall. Cubage: 45,864.



THE HIGHLANDS, SEATTLE, WASH. J. LISTER HOLMES, ARCHITECT



Richard Garrison Photos





VIEW 1.

VIEW 2.

CONSTRUCTION OUTLINE

FOUNDATION: Reinforced concrete. Water-proofing—Pabco, The Paraffine Cos., Inc.
STRUCTURE: Exterior walls — vertical grain cedar, paper, shiplap, studs; inside—U. S. Gypsum Co. lath and plaster. Floor construction—sub-floor, paper, oak finish.
ROOF: Covered with shingles. Deck—covered with Mastipave, Cott-A-Lapp Co.
FIREPLACE: Damper—The Majestic Co.
INSULATION: Attic floor—rockwool.
WINDOWS: Sash — steel, Fenton Steel Works. Glass—double strength, quality B, Libbey-Owens-Ford Glass Co. Screens—Chamberlin Metal Weather Strip Co.
STAIRS: Main: Treads—oak. Risers, rail and stringers—Lamoa plywood.
FLOOR COVERINGS: Main room—oak. Kitchen and bathrooms—linoleum, Armstrong Cork Co.
WALL COVERINGS: Living rooms—gum plywood. Halls—Lamoa plywood. Bathrooms—Linowall, Armstrong Cork Co.
HARDWARE: By Yale & Towne Co. and Stanley Works.
PAINTS: By Schorn Paint Mfg. Co. and Pratt & Lambert, Inc.
ELECTRICAL INSTALLATION: Wiring system—knob and tube. Switches—Harvey Hubbell, Inc.
KITCHEN EQUIPMENT: Range—gas. Refrigerator—electric. Sink—American Radiator-Standard Sanitary Corp.
BATHROOM EQUIPMENT: By American Radiator-Standard Sanitary Corp. Shower—Adjusto, Milwaukee Flush Valve Co.
HEATING: Forced warm air system, filtering and humidifying. Regulators—Minneapolis-Honeywell Regulator Co. Water heater—Wesix, Inc.



THREE BEDROOMS, TWO BATHS, LIBRARY, BASEMENT GARAGE



EAST ELEVATION



WEST ELEVATION

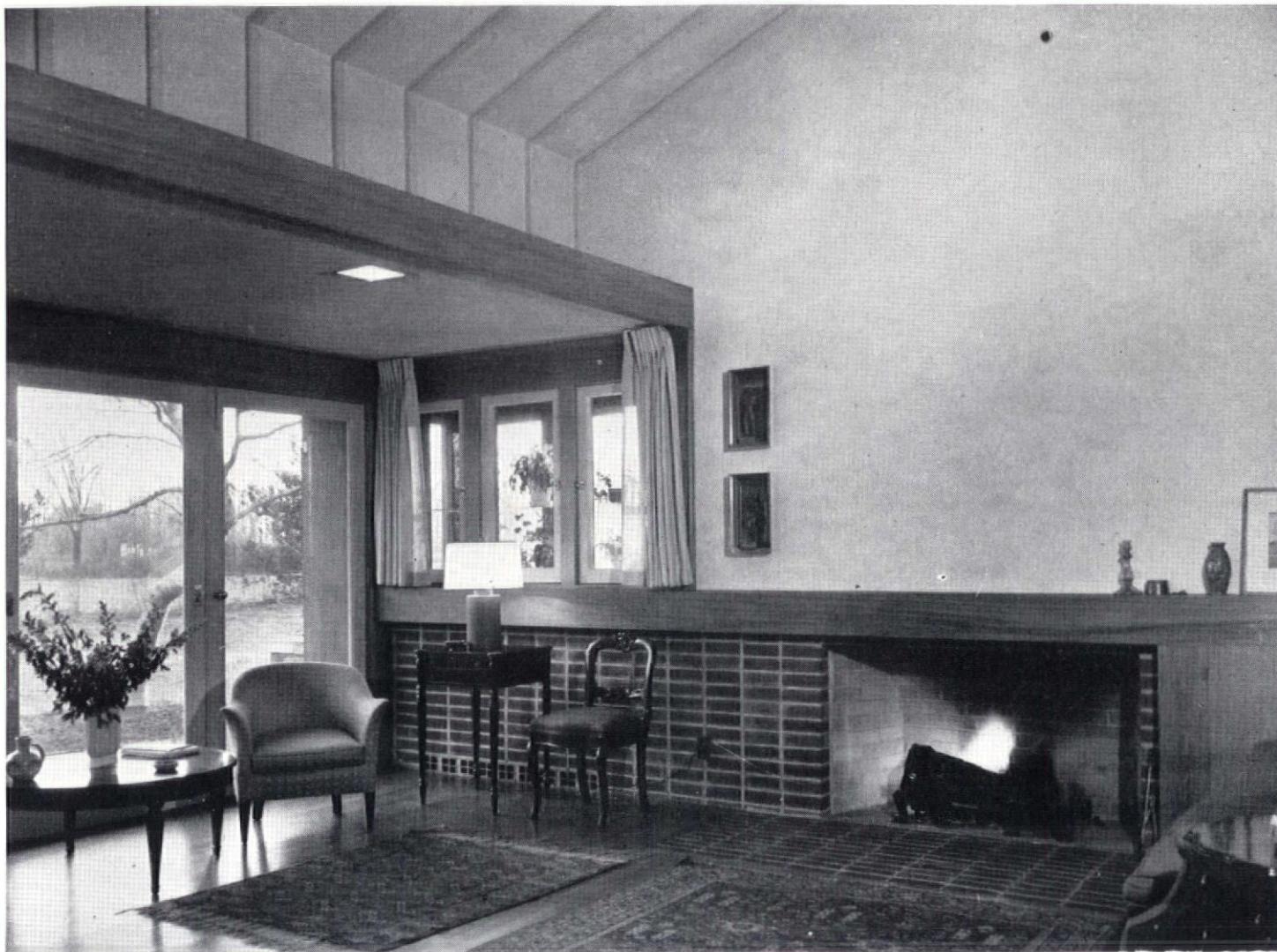
Everett Wood Photos

SOUTH TERRACE

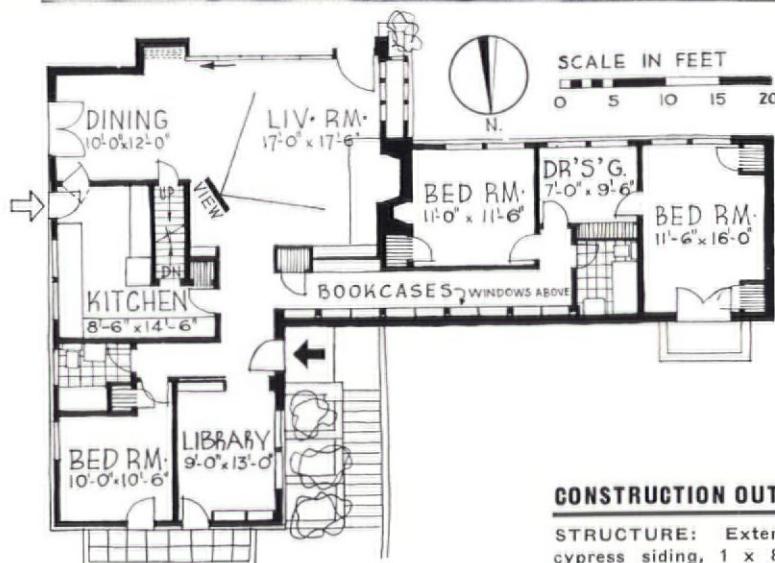


ENTRANCE

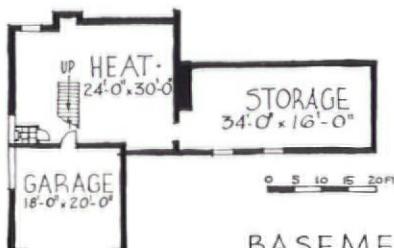




LIVING ROOM



FIRST FLOOR



BASEMENT

CONSTRUCTION OUTLINE

STRUCTURE: Exterior walls—brick and cypress siding, 1 x 8 in. boards, Haydite block backup, Haydite Co.; inside—studs, lath and plaster.

ROOF: Covered with slate. Deck covered with Traffic Top, Celotex Corp.

FIREPLACE: Damper—H. W. Covert Co.

SHEET METAL WORK: Flashing—16 oz. copper, Revere Copper & Brass, Inc. Ducts—Armco galvanized steel, American Rolling Mill Co.

INSULATION: Outside walls — Vaporseal, Celotex Corp. Attic floor—Balsam Wool blanket, Wood Conversion Co. Weatherstripping—copper.

WINDOWS: Sash — millmade, casement. Glass—quality AA and polished plate, Libbey-Owens-Ford Glass Co.

FLOOR COVERINGS: Kitchen and bathrooms—linoleum, Armstrong Cork Co.

WALL COVERINGS: Bathrooms — Wall-Tex, Columbus Coated Fabrics Co.

WOODWORK: Cypress and white pine.

HARDWARE: By Sargent Co.

PAINTS: By Dean & Barry Paint Co.

ELECTRICAL INSTALLATION: Wiring system—General Electric Co. Switches — Bryant Electric Co.

BATHROOM EQUIPMENT: By Kohler Co. Seat—C. F. Church Mfg. Co. Cabinets—Miami Cabinet Div., Philip Carey Co.

PLUMBING: Hot and cold water pipes—Anaconda copper, American Brass Co.

HEATING: Gas fired forced warm air system, humidifying, L. J. Mueller Furnace Co.

Regulator—Minneapolis-Honeywell Regulator Co. Water heater—Fosco, F. O. Schoedinger Co.

FOUR BEDROOMS, THREE BATHS, SERVANT'S ROOM AND BATH, STUDY



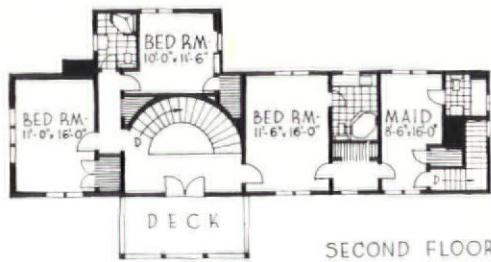
Erven Jourdan Photos

SOUTH ELEVATION

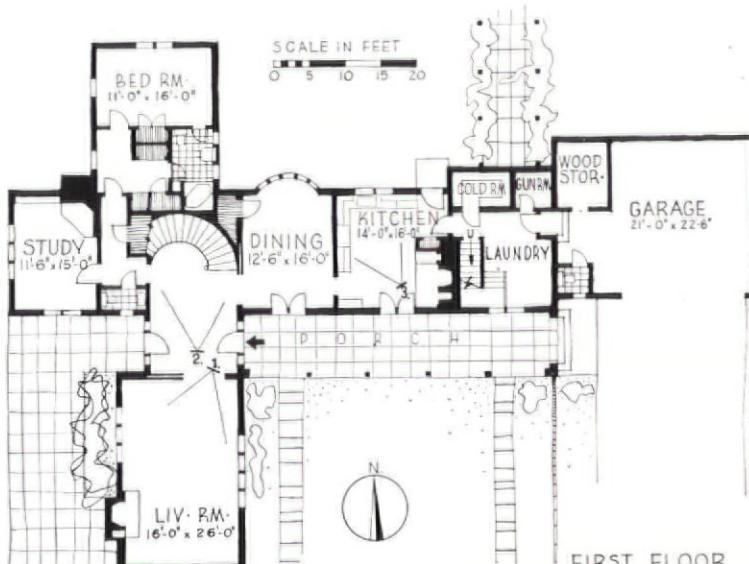


ENTRANCE SIDE

An uncommonly clean and attractive design, beautifully adapted to its site. Dwarfed by the trees which surround it, the house is nevertheless a large one, with an elongated ground floor only partly covered by the four bedrooms above. The second floor porch which adjoins the stair hall is rather startling, as this useful and once almost universal part of the American domestic scene has been conspicuously avoided in recent years by eclectics and modernists alike. Much of the interest of the house derives from the manner in which it spreads over the site, and the curved garden wall plays an important part in more closely relating the building to the ground. The extended plan has many advantages, chiefly in the provision of many rooms with three exposures, and through ventilation for almost all others. Due also to the system of projecting wings is the very desirable privacy given the study and guest bedroom. Cubage: 52,065, at approximately 50 cents per cu. ft.



SECOND FLOOR



VIEW 1.



Erven Jourdan

CONSTRUCTION OUTLINE

FOUNDATION: Concrete.

STRUCTURE: Exterior walls—studs, ship-lap, building paper, brick veneer and cedar resawn siding finish; inside—studs, rocklath, U. S. Gypsum Co. and plaster. Floor construction—oak finish.

ROOF: Covered with shingles. Deck—covered with canvas.

SHEET METAL WORK: Flashing—galvanized iron.

INSULATION: Attic floor—rockwool, Johns-Manville. Weatherstripping — Chamberlin Metal Weather Strip Co.

WINDOWS: Sash—wood, casement. Glass—Pennvernon plate and crystal plate.

STAIR: Balusters—maple; remainder—oak.

FLOOR COVERINGS: Main rooms—carpet.

Kitchen and bathrooms—linoleum, Armstrong Cork Co. Some tile in bathrooms—Gladding, McBean & Co. and N. Clark & Son.

WALL COVERINGS: Living room—grass cloth. Bedrooms—wallpaper.

HARDWARE: By Schlage Lock Co.

PAINTS: By W. P. Fuller & Co.

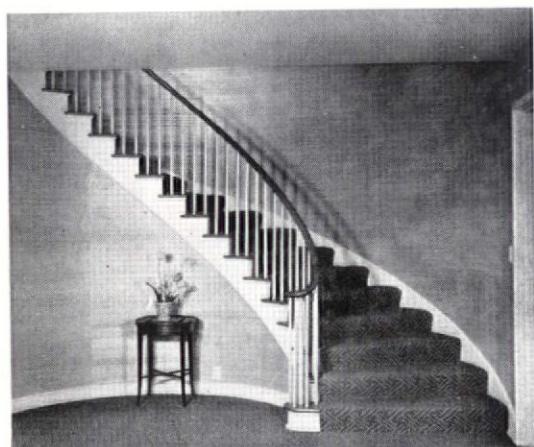
ELECTRICAL INSTALLATION: Wiring system—General Electric Co. Switches—General Electric Co. and Baker-Baxon Corp.

KITCHEN EQUIPMENT: Range, refrigerator, sink and dishwasher—General Electric Co.

BATHROOM EQUIPMENT: By American Radiator-Standard Sanitary Corp. Cabinets—Hall Mack, Hallenscheid & McDonald.

PLUMBING: Soil pipes—cast iron. Hot and cold water pipes—galvanized iron.

HEATING: Sun Beam furnace, forced air system, humidifying, The Fox Furnace Co. Filters—American Air Filter Co., Inc. Grilles—Hart & Cooley. Regulators—Minneapolis-Honeywell Regulator Co. Water heater—Wesix, Inc.



Kennell-Ellis

VIEW 2.



Kennell-Ellis

FOUR BEDROOMS, TWO BATHS, SHOWER ROOM, PLYWOOD FINISH INSIDE



Richard Garrison Photos

VIEW 1.

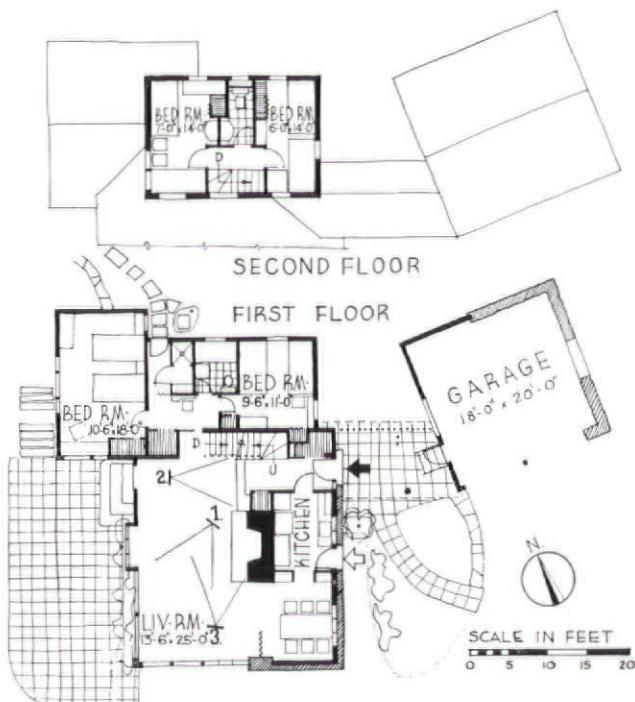


The architects comment: "The house was built in a club community with strict ordinances insisting upon gabled roofs and "protective coloration" to make the house blend into the woods."

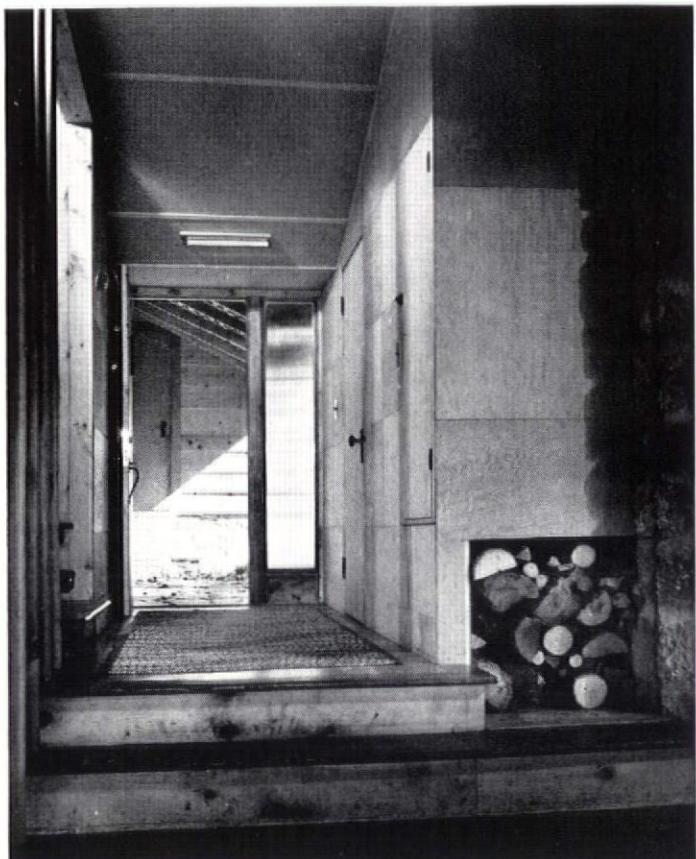
"The site is very steep, with view to the west, and the house was designed to command this view and to catch breezes from the south as well."

"Living areas are in a unit kept separate from the sleeping quarters. An outside entrance admits bathers to the shower and the bedrooms beyond. Placing of the kitchen enables the person cooking to take part in living room conversations, and to answer the door easily. Plaster was omitted for speed and economy."

Cost: \$8,477. Cubage: 21,040.



VIEW 2.



VIEW 3.



CONSTRUCTION OUTLINE

STRUCTURE: Exterior walls—red cedar, bevel siding, Colonial Lumber Specialties Co., Vaporseal sheathing, Celotex Corp.; inside—studs, fir plywood, U. S. Plywood Co. and Insulite of Greylite plank, Insulite Co. Floor construction — sub-floor, oak strip and fir finish.

ROOF: Covered with red cedar shingles, Colonial Lumber Specialties Co.

FIREPLACE: Damper—H. W. Covert Co.

SHEET METAL WORK: Ducts—galvanized iron; remainder—copper.

INSULATION: Outside walls — Vaporseal, Celotex Corp. Ceilings—Insulite plank, Insulite Co.

WINDOWS: Sash—pine casement, Andersen Frame Corp. Glass—single and double strength, quality A, Pittsburgh Plate Glass Co.

FLOOR COVERINGS: Living room—oak strip, E. L. Bruce Co. Bedrooms—fir. Kitchen and bathrooms—fir, linoleum covered, Armstrong Cork Co.

WOODWORK: Trim—pine. Cabinets—pine plywood, U. S. Plywood Corp. Exterior doors —fir and Preswood, Masonite Corp.

HARDWARE: By Yale & Towne Mfg. Co.

ELECTRICAL INSTALLATION: Wiring system—BX. Switches—tumbler. Fixtures—Sears, Roebuck Co.

KITCHEN EQUIPMENT: Range and refrigerator—General Electric Co.

BATHROOM EQUIPMENT: By Sears, Roebuck Co.

PLUMBING: Soil pipes—cast iron. Hot and cold water pipes—galvanized iron.

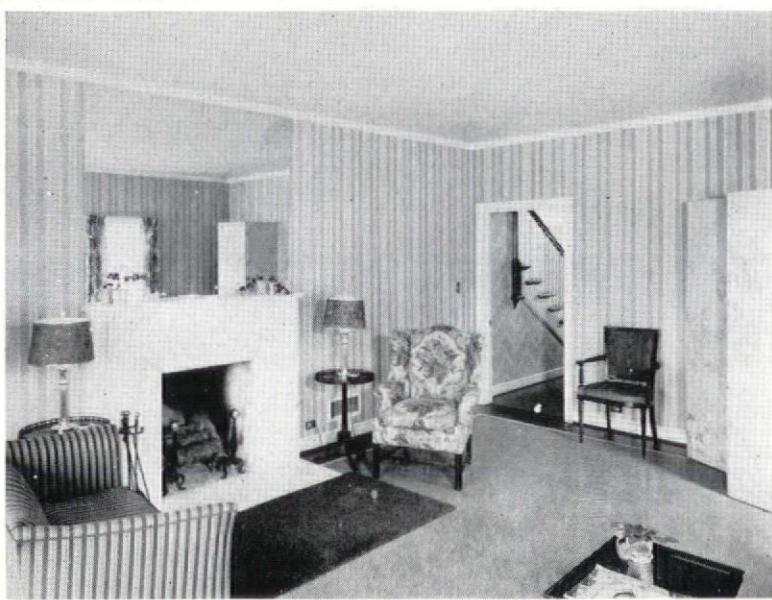
HEATING: Coal fired hot air furnace, gravity system, Sears, Roebuck Co. Water heater —General Electric Co.

FOUR BEDROOMS, TWO BATHS, SERVANT'S ROOM, BATH, STUDY



* File Photos, Courtesy of Armstrong Cork Co.

LIVING ROOM



ENTRANCE HALL

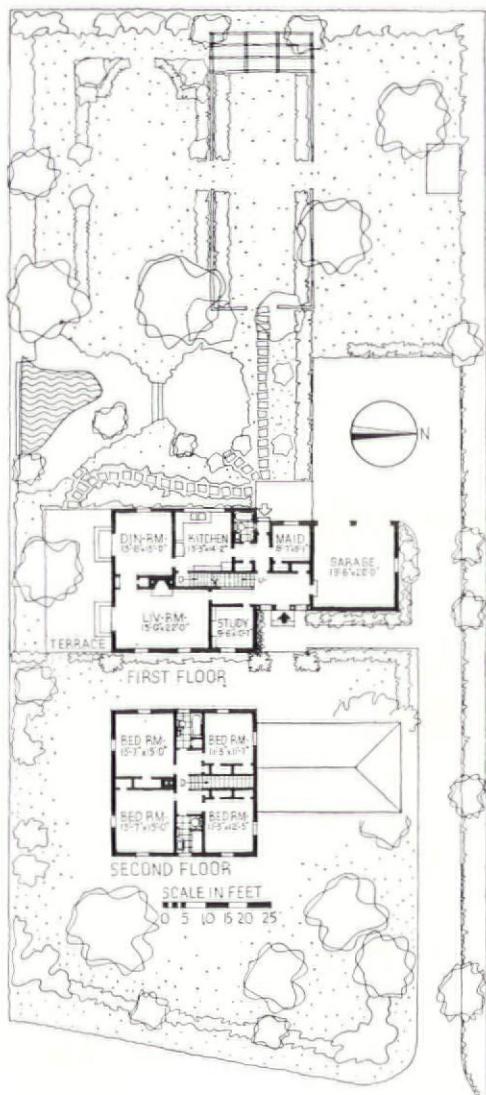


DECATUR, ILL.

JAMES GRADY, MARLOWE LINE,
DESIGNERS

IRVING L. PETERSON,
LANDSCAPE ARCHITECT

Designed for a family with two boys and two girls, this house shows the conventional square plan with some unusual features. The entrance is beyond the main block of the house, in a link between house and garage. There is a study adjoining the living room, a highly desirable addition to a house used by six people. The kitchen is larger than average, and is used by the children for eating and studying. In each of the children's bedrooms there are two closets. The house occupies a fairly generous lot, with excellent space for gardens at the rear. For reasons of appearance, it would seem, the doors of the garage face away from the street, entailing added expense for the driveway, inconvenience and the waste of good garden space. Cost: \$14,800.

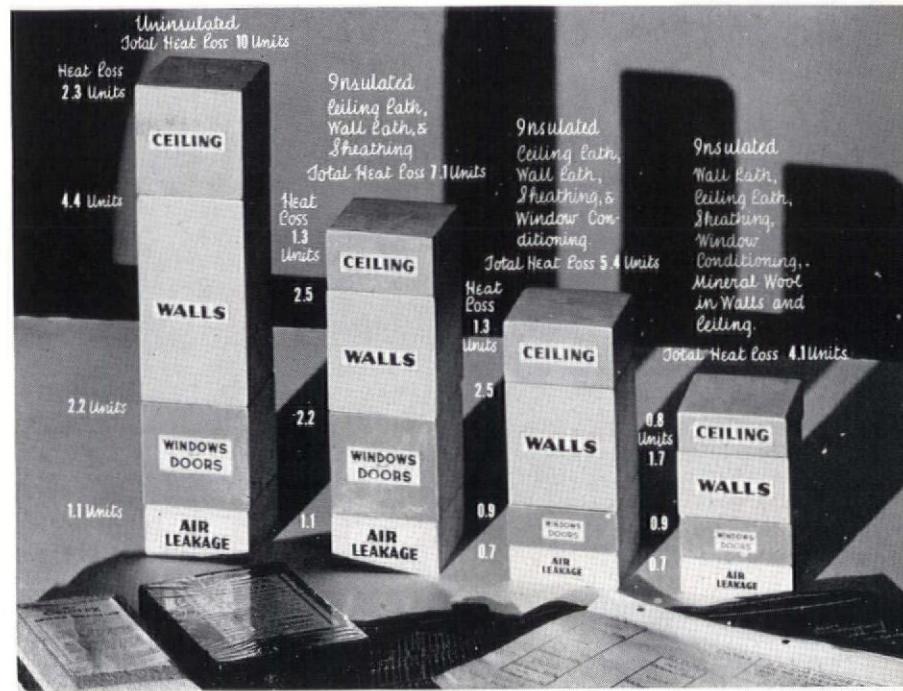


BUILDING MONEY

CONTENTS:

INSULATION SAVINGS	63
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REMODELED TENEMENT	70

Heat loss dramatized by Celotex Corp.'s box of blocks proves the economy of total insulation. Thus, stack to the left represents the ten units of heat lost in an uninsulated house; stack to the right, the 4.1 units lost in the same house completely insulated and window conditioned. Size of each block shows the relative amount of heat lost through roof, walls and windows and around all openings. (See text, p. 64, col. 3.)



THE CASE FOR TOTAL INSULATION *is advanced by the prospective fuel shortage and by manufacturers' reciprocal promotion. A dollar-and-cents analysis of its meaning in five house types, three climate zones.*

Strange and potentially powerful is the combination of events which in recent months has given a boost to the already growing impetus behind home insulation. Components of the industry itself have wisely awakened to the advantages of promoting the unquestioned economy of total insulation rather than attempting to push their own parts of the insulation package by playing down the parts produced by non-competitive companies. In effect, they are now selling the public, first, on the comfort, health and financial savings of complete insulation and, then, on the merits of their own particular products in partially achieving this end. For the building industry, which benefits from keen competition but suffers from a lack of package merchandising, this indication of reciprocal, cooperative promotion is encouragingly significant.

Equal in distance to this forward step by the insulation industry itself have been several other unexpected and indirect plugs for home insulation from far afield: In April, Chief Engineer Paul M. Tyler of the Bureau of Mines' Nonmetal Economics Division devoted 12 pages of a Government information circular to prove that wide-spread home insulation would facilitate national defense by conserving fuel resources, by lessening the acute demand for labor, by freeing transportation facilities for vital defense articles and by reducing the running expense of Govern-

ment-operated defense housing. In May, a serious strike by powerful coal mining labor unions prompted consumers the country over to cast anxious eyes at their storage bins. In June, the effect of increased Army mechanization and the transfer of a fleet of oil tankers to Britain caused defense officials to worry about domestic oil production and delivery and to discuss prospective shortages and such preventative measures as "gasless" Sundays and an enforced 5° drop in home temperatures.

Insulation for defense. Importance of home insulation to national defense is seen in the Bureau of Mines' statistics concerning fuel consumption for heating purposes. Each year the public burns 35 million tons of anthracite, 55-75 million tons of bituminous and other classes of coal, 9 million tons of coke, 175 million barrels of oil and 760 billion cu. ft. of gas. The producers' annual charge for this fuel is some \$670 million but, by the time transportation costs and retailers' expenses and profits have been added, the annual bill to consumers is not far from \$1.5 billion. The Bureau of Mines estimates that if the country's 37 million dwelling units and all its schools, offices, etc. were insulated the public would save \$1 billion a year in heating costs. (It does not, however, suggest a solution for the unemployment problem among miners and oil field workers which a 50 per cent drop in the peacetime

fuel market would naturally entail.)

More realistic is the Bureau's reasoning that if Government fully insulated the 200,000 dwelling units it proposes to build under the defense housing program, it would save the taxpayers a cool \$5 million a year and would permit the sidetracking of 12,000 carloads of coal, 8,400 tank cars of oil or the equivalent for more essential defense purposes. And, complete insulation of all the 500,000 odd dwelling units to be built in the U. S. this year would mean a total heating fuel cost saving of \$12.5 million annually. With these and other substantiating statistics behind its argument, the Bureau of Mines points an accusing finger at other Government agencies and the home building industry in general, preaches: "As the capital cost of insulation now can be repaid by the savings on fuel each year, no good reason is apparent for tolerating such waste in new construction."

Insulation for profit. Convincing as these defense program generalities are, home insulation does not need to be seasoned with patriotism to be sold. It can stand on its own feet as a money saving device. When manufacturers began to realize and publicize this important fact five years ago, insulation's sales curve bounded up; every fourth house built today is at least partially insulated and some 800,000 old houses have been insulated in one way or another.

When the full financial meaning of complete insulation is grasped by manufacturers, dealers, builders and in turn, the consuming public, the market will open still wider, insulation sales talk will be more effective, mortgage security will be stronger, revenue producing properties will be more productive and houses will be more comfortable, healthy, cheaper to heat, easier to keep cool. Finally, home insulation will save fuel for national defenders and save home owners from the defense-boomed rise in fuel costs.

One of the first companies to launch a promotional, educational program concerning the benefits of more than one type of insulation was Libbey-Owens-Ford Glass Co. Last year it asked Heating Expert Alfred J. Offner, Council Member of the Society of Heating and Ventilating Engineers, to calculate for various U. S. climate zones the fuel savings that would result from the installation of double-glazing or storm sash (called window conditioning) and the provision of attic insulation in five different types and sizes of houses. It was logical for a glass manufacturer to compare its "window insulation" with attic insulation, for the latter is not only the most widely accepted form of insulation but is also less effective than the former. (Engineer Offner's statistical proof of this point was no surprise to insulation authorities.) Nevertheless, the plugging of two types of insulation in one study was a new departure and a significant step toward the promotion of complete insulation as a package.

This spring, the Mineral Wool Assn., a small but energetic trade association for the producers of rock, slag and glass wool insulation, carried this same study one step further. To offset the comparatively poor showing made by attic insulation, as opposed to window conditioning, the Association asked Engineer Offner to add to his calculations the fuel savings effected by insulation (mineral wool, of course) of the side walls of the five representative houses. Again occasioning no surprise, the results proved that this type of insulation saves about the same amount of fuel as window conditioning.

Released last month for the benefit of home builders and buyers, the Association's presentation of comparative economies of the three phases of insulation is packed with convincing statistics but none is more significant than the mineral woolers' accompanying statement that "no form of insulation can be neglected without loss . . . each is good in its own way but . . . the use of one does not eliminate the need and advantage of the others." Much to the delight of glass companies, window conditioning is boosted along with wall and attic insulation as part of a complete home insulation package.

Attic. Tabulated to the right are the detailed findings of Engineer Offner. Taking the figures for the third or "moderate" zone as the most typical of the three climate belts covered in the study (they blanket roughly the northern half of the U. S.), it is seen

that attic insulation in the form of $3\frac{1}{8}$ in. of mineral wool cuts as much as 23 per cent off the fuel bill of story-and-a-half House No. 4, as little as 16 per cent off the gable-roofed House No. 2. Translated into hard cash, these savings amount to \$22 and \$17 per year, respectively — far more than enough to cover the amortization of the attic insulation investment over a 25 year period. Thus, at an installed cost of 6 cents per sq. ft., attic insulation in House No. 2 would cost about \$46, would raise the 10 per cent cash downpayment on the house by less than \$5, the 25-year mortgage payments by only 24 cents per month or about \$2.90 per year.

Purpose of this phase of insulation is to arrest winter heat loss, 40 per cent of which filters through the attic floor and roof of an uninsulated house, and to act as a barrier against the admission of summer heat, two-thirds of which would otherwise come in through the roof.

Side walls. But attic insulation accounts for a small part of the economy of total protection. Its importance is dwarfed by sidewall insulation except in flat-roofed House No. 5, whose gross wall area is 30 per cent glass, and House No. 4, whose attic area is comparatively large. Biggest fuel saving by sidewall insulation is achieved in House No. 2 where it clips \$29, or more than 27 per cent, off the average annual heating bill of \$106. That is a gross economy of more than \$2.40 per month. If covered by a 25-year FHA-insured loan, the initial \$114 cost of this insulation ($3\frac{1}{8}$ in. mineral wool at 7 cents a sq. ft.) would up the required monthly mortgage payments by only about 60 cents, leaving a net saving of about \$1.80 per month, or \$22 per year. And, on the basis of a 10 per cent downpayment, the insulation would involve only \$11 in cash.

Since sidewall insulation helps maintain inside wall surfaces at comparatively high temperatures and thus cuts down the radiation of heat from the human body to the walls, comfort is achieved at a lower temperature than in an uninsulated house. (Substantial but difficult to estimate, the resultant fuel saving is not considered in this presentation.)

Windows. For the same reasons, window conditioning is even more important. Thus, heat is lost through a single thickness of glass at a rate 5 to 15 times faster than through adjacent walls. In the five representative house types examined by Offner the annual fuel saving accomplished by window conditioning varies from \$23 to \$42 per year in accordance with the various heating requirements, but runs close to 24 per cent for each house.

Unfortunately, many financial institutions have not accepted complete window conditioning as an essential part of house construction. While they willingly include the cost of weatherstripping in their appraisals, they balk at increasing the loan on a house to cover the added cost of double glazing or storm sash. Thus, the 24

per cent fuel saving may frequently be reaped only after an out-of-pocket cash investment which would amount to roughly \$60 for house No. 2. However, where this cost may be covered by a 25-year mortgage, the downpayment on this house would be boosted by only \$6, the monthly payments by only 31 cents. Net saving: about \$22 per year.

Total insulation. Comprised of the three phases discussed above, total insulation means a gross annual fuel saving of about 68 per cent for all house types, except No. 5 in which the economy is limited to 54 per cent by virtue of the unusually large glass area. Dollarwise, complete insulation means a gross saving of anywhere from \$54 (House No. 5) to \$119 (House No. 1) per year, or \$4 to \$10 per month. Assuming that the additional cost (\$220) of all this insulation in house No. 2 were included in a 25-year FHA-insured mortgage, it would account for only \$1.15 of the monthly payments, would therefore leave \$58 as the net annual saving achieved by complete insulation. And, the 10 per cent down payment on this house would be upped by only \$22.

With such documented evidence of the economy of total home insulation, the materials which comprise it should sell themselves. However, builders, financiers, and the public have yet to hear the evidence, are yet to be convinced. The widely distributed statistical study prepared by the Mineral Wool Assn. should prove effective in this direction.

Insulation dramatics. To tell the same story in a more visual manner, the Celotex Corp. has recently supplied its dealers with a demonstration kit comprised of sixteen small colored wooden blocks (see photograph, p. 63). By stacking these blocks in four piles, the dealer dramatically shows his prospect the heat loss stopped by various degrees of insulation. Basis for the demonstration is a typical six-room frame house with about 1,500 sq. ft. of net sidewall area, 700 sq. ft. of ceiling area and 170 sq. ft. of window and door area comprising seventeen windows and doors.

Tallest stack of blocks represents the ten units of heat loss in the uninsulated house —or, say, the 10 tons of coal required to heat this uninsulated house each year. As shown by the relative size of the four blocks in this stack, heat from 2.3 tons of coal escapes through the ceiling, 4.4 tons through the walls, 2.2 tons through the doors and windows, and 1.1 tons through the cracks around these openings. The second column dramatizes the effect of installing 700 sq. ft. of insulating lath in the ceilings of the house and 1,500 sq. ft. of both insulating lath and insulating sheathing in the sidewalls. At an extra cost of, say, \$100, this much insulation reduces the heat loss by 2.9 tons which, if coal is assumed to cost \$10.50 per ton, means a 30 per cent return on the insulation investment.

Difference in height of the second and third stack of blocks is achieved by the

INSULATION SAVINGS by house types and climate zones



Attic area	1488.5 sq. ft.	770 sq. ft.	1143 sq. ft.	995 sq. ft.	782 sq. ft.
Sidewall area (net)	2447.7 sq. ft.	1634 sq. ft.	1332 sq. ft.	1197.5 sq. ft.	695 sq. ft.
Window area	540.3 sq. ft.	326 sq. ft.	363 sq. ft.	285 sq. ft.	280.8 sq. ft.
Crack length	590.4 lin. ft.	389 lin. ft.	422 lin. ft.	365 lin. ft.	436 lin. ft.

COLD ZONE

Heating Cost, No Insulation	\$315.50	\$190.60	\$211.00	\$173.80	\$178.50
Savings					
Attic Insulation	61.00 19.3%	31.10 16.3%	46.30 21.9%	39.90 23.0%	31.60 17.7%
Sidewall Insulation	78.50 24.9%	52.50 27.5%	47.50 22.5%	38.40 22.1%	22.30 12.5%
Window Conditioning	74.25 23.5%	46.05 24.2%	51.50 24.4%	41.90 24.1%	41.50 23.3%
Complete Insulation	213.75 67.7%	129.65 68.0%	145.30 68.8%	120.20 69.2%	95.40 53.5%

INTERMEDIATE ZONE

Heating Cost, No Insulation	\$245.00	\$149.30	\$161.00	\$136.00	\$139.55
Savings					
Attic Insulation	47.00 19.2%	24.40 16.3%	36.00 22.4%	31.60 23.3%	24.80 17.7%
Sidewall Insulation	61.00 24.9%	41.00 27.5%	36.70 22.5%	30.00 22.1%	17.40 12.5%
Window Conditioning ...	58.75 24.0%	36.50 24.4%	38.00 23.6%	32.20 23.7%	32.65 23.4%
Complete Insulation	166.75 68.1%	101.90 68.2%	110.70 68.5%	93.80 69.1%	74.85 53.6%

Moderate Zone

Heating Cost, No Insulation	\$176.00	\$106.35	\$116.30	\$ 96.30	\$100.50
Savings					
Attic Insulation	33.50 19.0%	17.40 16.4%	25.60 21.9%	22.30 23.2%	18.10 18.0%
Sidewall Insulation	43.80 24.9%	29.20 27.5%	26.20 22.5%	21.30 22.1%	12.60 12.5%
Window Conditioning ...	41.75 23.7%	25.55 24.0%	28.40 24.3%	22.65 23.5%	23.50 23.4%
Complete Insulation	119.05 67.6%	72.15 67.9%	80.20 68.7%	66.25 68.8%	54.20 53.9%

NOTES: These data have been compiled by Engineer Alfred J. Offner for Libbey-Owens-Ford Glass Co. and the Mineral Wool Assn. Heating costs are based on an oil fuel cost of 7 cents per gallon. COLD ZONE covers the northernmost part of the midwest, includes Minneapolis and St. Paul. INTERMEDIATE ZONE covers parts of Wyoming, South Dakota, Nebraska, Iowa, Minnesota, Wisconsin, Michigan, New York and the New England States, includes Milwaukee, Lansing, Syracuse and Portland. MODERATE ZONE runs roughly from central Colorado

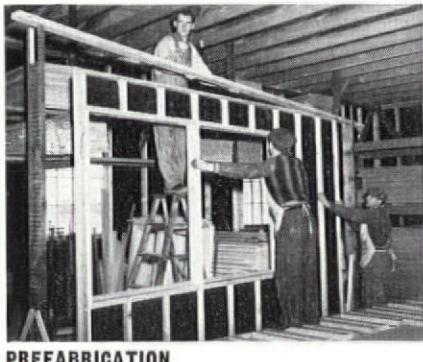
through Massachusetts, includes Kansas City, St. Louis, Indianapolis, Columbus, Pittsburgh, Newark, New York and Boston. Approximate data for intermediate localities may be determined by interpolation. House No. 5 is the only one without a basement. All attics are assumed to be ventilated above the insulation. Data are based on attic and side wall insulation comprised of 3% in. mineral wool. Savings in the reduced size of heating plants and in lower comfort temperatures, which insulation permits, were not considered in this computation.

addition of storm sash and doors and represents a further reduction of the total heat loss to 5.4 tons. (Heat loss through the windows and doors is reduced by 1.3 tons and through air leakage by 0.4 tons.) If this window conditioning costs an extra \$50, the fuel savings represent an annual return of about 32 per cent on the combined \$150 investment in insulation. In the fourth case, 3½ in. mineral wool insulating batts were installed in the ceiling and 2 in. of paper-backed mineral wool was added to the side walls at, say, \$135. Result: the \$285 worth of complete insulation reduces the total heat loss to 4.1 tons, earns a return of about 22 per cent. Home

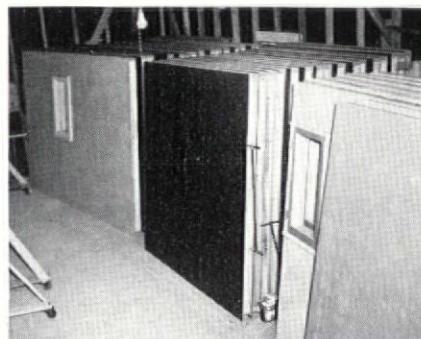
owners, operators of rental buildings and mortgage banks will look far for blue-chip investments comparable in return to that proved for insulation by Celotex' box of blocks.

By studying and publicizing such dollar and cents benefits of complete home insulation, the building industry may make a generous contribution to the quality of today's houses, to the pocketbooks of home owners and, left handedly, to the oil shortage problem of national defenders. Urgency of this problem was indicated month ago in a report of the American Petroleum Institute to the defense program's newly appointed Petroleum Coordinator Harold

Ickes: "Distillate fuel oil is used largely for heating purposes. Therefore, any effective restriction would have to be obtained in this type of usage. If house temperatures were reduced by an average of about five degrees Fahrenheit, approximately 10 per cent of the consumption of heating oils could probably be saved." True, but in the light of the foregoing statistical demonstrations, widespread home insulation would unquestionably prove to be more effective (and certainly easier) than door-to-door enforcement of a 5° home temperature drop. It would also be more economical, comfortable and healthy for the public.



PREFABRICATION



PANEL STORAGE



FLOOR LAYING

PRIVATE ENTERPRISE HITS NEW RENTAL LOW when prefabrication and \$22,800 in cold cash produce ten \$23-per-month houses in Madison, Wis.

Best defense against Government invasion of the housing field is private construction of really low rent housing. Today this defense is tragically weak; only a handful of investors have earnestly tried to shave construction and operating costs to the bone and have then satisfied themselves with a small but steady rental income instead of with the usual quick financial killing.* Their small isolated projects are, however, challenging proof that unassisted private enterprise can produce low rent housing. Latest addition to this honor roll is a group of ten prefabricated four-room houses whose modern design strikes a pleasing note in the rural landscape 2½ miles outside Madison, Wis., and whose \$23 per month rentals serve small families in the \$800-\$1,200 income bracket, pay a modest but sure 2 per cent profit to their sponsors. Moreover, the project is added at the top of the honor roll, for its unsubsidized \$5.75 per room rentals are the lowest on private enterprise's record.

Completed last month, this project was conceived three years ago when two of Madison's public spirited citizens set out to explore the possibilities of profitable low rent housing and to set an example for duplication, if successful, in other communities. Local Architect-Partners Hamilton Beatty and Allen J. Strang were commissioned to apply their low cost housing knowledge to the design of a project that would hit bottom as far as rents were concerned. Both had studied abroad after U. S. college educations, both had helped the U. S. Forest Products Laboratory develop the first experimental stressed plywood prefabricated house in 1935, and in their subsequent partnership both had devoted much study and practice to the design of integrated and prefabricated construction. To minimize costs they designed the project for prefabrication, vouching that it could be built and operated at the sponsor's prescribed figures. However, before a site was purchased, the proposal went on the shelf—the sponsors moved away for business reasons.

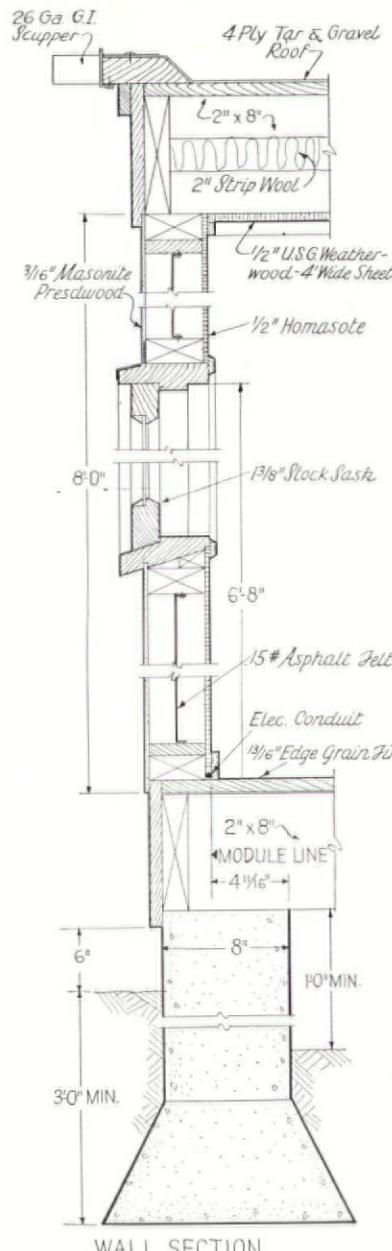
*For examples of this handful, see ARCH. FORUM, Dec. '38, p. 486; Aug. '39, p. 135; Dec. '39, p. 412; Nov. '40, pp. 454 & 456.

Last year it was taken down again when another group of anonymous but equally public spirited citizens decided to carry it through. Land was acquired in June, and two of the integrated plywood houses were built to test their design, construction and public acceptance. As a result of this experiment and on the advice of the tenants, Architects Beatty and Strang revised their floor plans, stretched the house's dimensions to include a laundry-storage room with direct access to the kitchen and to provide dining space in the kitchen. The latter was also opened to the living room to make the living area seem more spacious. Of course, costs were also revised.

Awarded in January, contract for the ten identical houses went to Severson-Schlitz Inc. of nearby Janesville when they offered to prefabricate and complete the project for about 12 per cent less than their nearest conventional construction bidder. Working indoors during their slack winter season, the prefabricators by March's end had finished the large panels including their painting, the installation of doors, windows, screens and hardware.

Embodying a combination of prefabrication systems developed by the architects, the contractors and the Forest Products Laboratory, the panels are comprised of jig-aligned framing pieces finished on the inside with sheets of $\frac{3}{16}$ in. pressed wood fiberboard, on the outside with $\frac{1}{2}$ in. repulped newsprint insulating board. Midway between these nailed and glued coverings is a layer of 15 lb. asphalt saturated felt. All wall panels are ceiling height (8 ft.) in width, and most of them are 12 ft. long. Their joints, in all but three cases, are concealed behind the abutting ends of partition panels. An interesting departure from usual prefabrication technique was the laying in the shop of the complete floor and roof for each house and then the cutting of them into easily handled panels. The former were insulated with 15 lb. asphalt felt, the latter with 2 in. mineral wood batts and moisture barrier. To protect the panels during their fabrication and delivery, they were moved about the shop on wheeled racks and

(Continued on page 40)



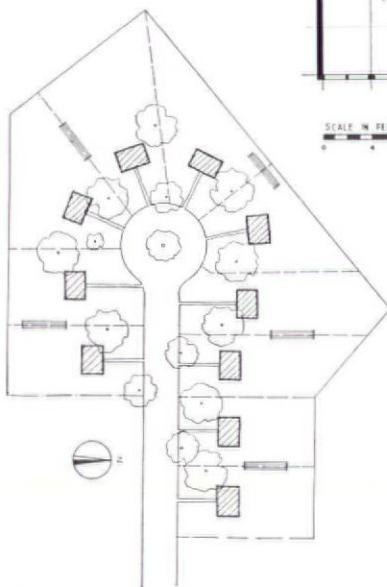
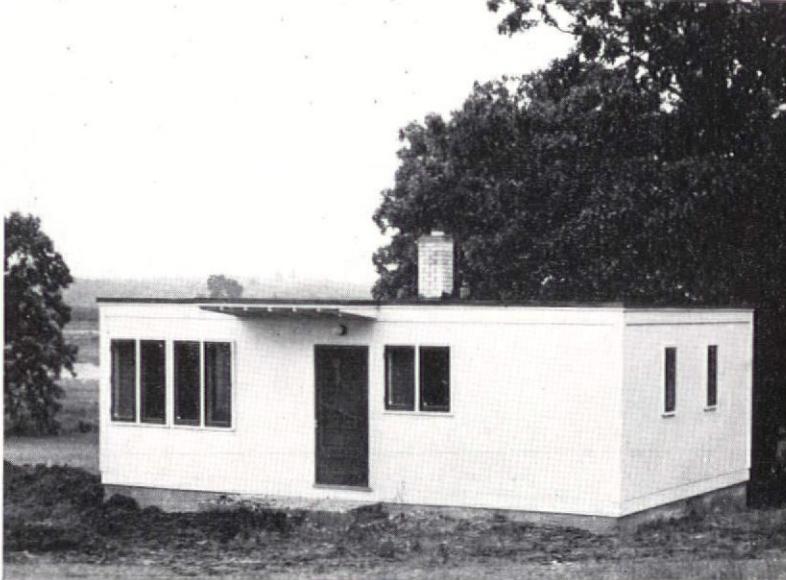
Construction details of the ten \$23-per-month houses are a composite of prefabrication methods developed by the Forest Products Laboratory, by Contractors Severson-Schlitz Inc. and by Architects Beatty and Strang. All sheet materials are glued and nailed to the studding in the shop.



WALL ERECTION



ROOF CONSTRUCTION



COST AND OPERATING STATEMENT per dwelling unit

Capital Investment

Land	\$ 175
Water and sewer service	110
Construction	1745
Landscaping	65
Stove, heater and refrigerator	100
Architect's fee	55
Window shades and contingencies	30
Total	\$2280

Operating Expenses per year

Management	\$ 22
Decoration	25
Replacement of stove, heater and refrigerator (10 yrs.)	10
Total	\$ 57

Fixed Expenses per year

Taxes	\$ 42
Depreciation (20 yrs.)	114
Insurance	5
Total	\$ 161

Gross Income

12 mos. rent @ \$23 per month	\$ 276
Less 1/2 mo. vacancy per year	12
Total	\$ 264

NET YIELD

Gross Income	\$ 264
Less operating and fixed expenses	218
Total (equals 2% of investment)	\$ 46



KITCHEN-LIVING ROOM

MODERN ROW HOUSES

Builders Tiffey sell ten at \$10,750 each, will do it again.



With increasing momentum, modern design is breaking into the building money field. Last month, THE FORUM showed how a speculative subdivision of ten modern frame houses successfully invaded Cape Cod's stronghold of Colonial tradition. This month THE FORUM presents ten Modern brick row houses which blend agreeably with the traditional architecture of the nation's capital. Sold with encouraging speed at \$10,750 with lot, they are the harbingers of seventeen more speculative houses on which construction has begun.

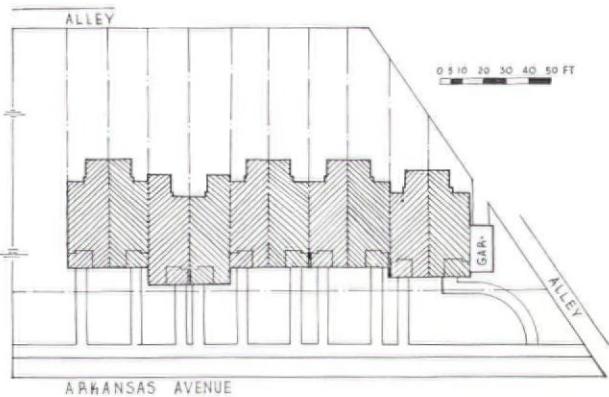
Situated one block off 16th Street—address of many of Washington's swankiest Embassies, churches and residences—the site of this modern row house project ideally faces a public park and is only one block away from shopping facilities and two transportation lines connecting it with the downtown area in a flat fifteen minutes. Only disadvantage which Builders John B. Tiffey and Son Robert P. could see when they purchased the property was the steep grade—a 20 ft. climb from the street to the rear alley. But, their architect, Joseph H. Abel, used his imagination, converted it into an advantage. Conventional planning would have called for a long unsightly flight of steps leading to a first floor entrance, so Architect Abel moved the entrance down into the basement, planned part of it as a foyer and reception-living room. Then, after he had submitted several exterior design studies aiming unsuccessfully to disguise the houses' three-story height, he convinced Builders Tiffey that modern with its horizontals would best fill the bill.

Completed at October's end, the first house was furnished by one of the local specialists in modern decoration and furniture and further promoted by weekly but modest display advertising and a couple of photographic feature articles in the local press. Results: the first house was sold within a month, the last of the trail-blazing ten by mid-February.

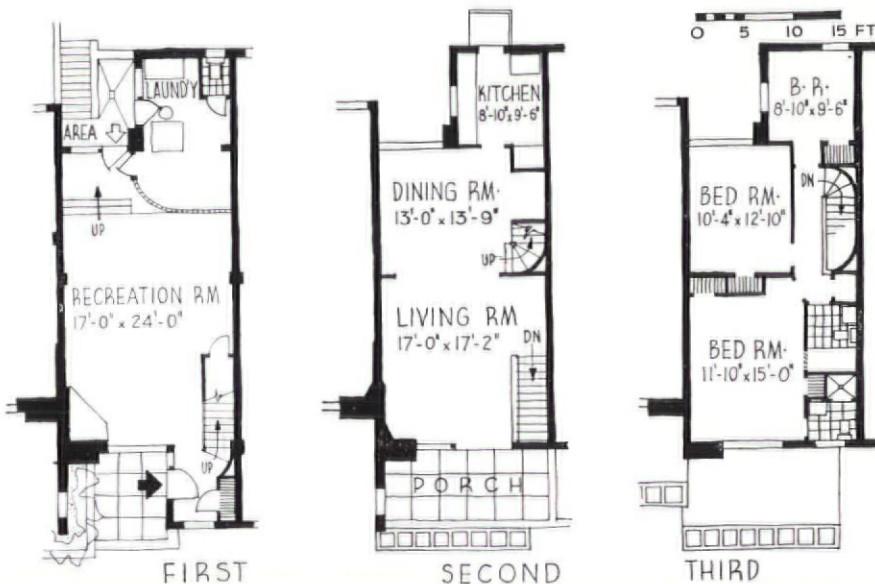
While they vary in some minor details, all houses were priced at \$10,750, including the \$1,250 cost of land and landscaping. Seven were sold for \$3,000 cash plus a \$7,750 uninsured mortgage held by a local savings and loan association and requiring a monthly payment of \$51.15 toward amortization and 5 per cent interest. In three other cases, the same mortgage was written, but the builders reduced the cash down payment by taking back a second trust. Despite the houses' modern design, the builders were able to obtain about the same mortgage-to-sales-price ratio (72 per cent) as in their earlier more conventionally designed subdivisions.

Launched since 1929 when the Tiffeyes shifted their Washington contracting business from tailor-made houses, garages and remodeling jobs to large scale speculative work, these previous subdivisions are comprised of some 350 houses, brand the father and son as no mean builders. Their success is attributable, in part, to the close attention paid to trends in the building industry practices and public preferences. Says Father Tiffey: "We have always tried to find new ideas for our developments, consequently we have used modern architecture in the latest development." The Tiffeyes plan to use modern design again in their next new project—fourteen two-family houses which will go up this month.

SOLVE SITE PROBLEM in Washington, D. C.



LIVING ROOM



LIVING ROOM



CONSTRUCTION OUTLINE

FOUNDATION: Brick, West Bros. Brick Co. and cinder block, Edmonds Art Stone Co. Waterproofing—Master Builders Co.

STRUCTURE: Exterior walls — 4 in. face brick, cinder block backup, furring strips; inside—U. S. Gypsum Co. Red Top lath and plaster.

ROOF: Covered with slag, Ruberoid Co. Deck covered with tin, Wheeling Corrugating Co.

INSULATION: Attic floor—2 in. Red Top roll blankets, U. S. Gypsum Co.

FIREPLACE: Damper — cast iron, Union Iron Works.

SHEET METAL WORK: Flashing, gutters and ducts—galvanized iron, Wheeling Corrugating Co.

WINDOWS: Sash—metal, Fenestra, Detroit Steel Products Co. Glass—double strength, quality B and crystal sheet, American Window Glass Co. Glass blocks — Pittsburgh Corning Corp. Screens—Coffey Bros. Screen Co.

FLOOR COVERINGS: Main rooms — white oak. Kitchen — linoleum, Congoleum-Nairn, Inc. Bathrooms—tile, Cambridge Tile Mfg. Co.

WALL COVERINGS: Main rooms — wallpaper, Capital Wall Paper Co. Kitchen and bathrooms — Wall-Tex, Columbus Coated Fabrics Corp.

PAINTS: By Pittsburgh Plate Glass Co., Benjamin Moore Paint Co. and National Lead Co.

WOODWORK: Trim — white pine. Cabinets and doors — Murphy Door Bed Co. Garage doors (one house only)—Frantz Mfg. Co.

HARDWARE: By Russell & Erwin Mfg. Co.

ELECTRICAL INSTALLATION: Wiring system—armored cable, Standard Electric Equipment Co. Switches—Hart & Hegeman Electric Co. Fixtures—Levolite Mfg. Co., Chase Brass & Copper Co., Moe Bros.

KITCHEN EQUIPMENT: Range — Quality gas, Roberts & Manders Co. Refrigerator—electric, Westinghouse Electric & Mfg. Co. Cabinets—Murphy Door Bed Co. Fan—Spartan, F. H. Smith Co.

BATHROOM EQUIPMENT: By Crane Co. Cabinets—The F. H. Lawson Co.

PLUMBING: Soil pipes—cast iron. Water pipes—galvanized iron.

HEATING: Conditioned air, filtering and humidifying, Bryant Heater Co. Grilles—Tuttle & Bailey. Regulator—Minneapolis-Honeywell Regulator Co.

TENEMENT RENOVATION

rivals swank New York neighbors. Architect Schneider aboutfaces entrances from street to garden court, ups income from zero to \$20,000.



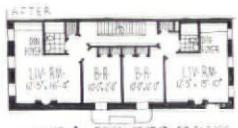
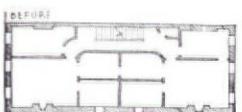
GARDEN COURT



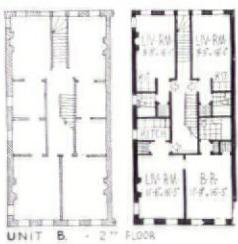
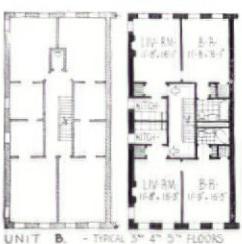
When a brightly polished penny outshines a \$20 gold piece, it can be considered a major triumph in renovation. Such is the comparison between Sutton Mews, recently remodeled "bowling alley" tenement, and some of its neighbors on Sutton Place, fashionable residential colony along Manhattan's East River. Rechristened and rehabilitated into 59 1½- to 4-room apartments which have been turned around away from the street to face a quiet exclusive garden court, the formerly vacant tenement block, which ate approximately \$4,000 in annual taxes, now yields at least a 10 per cent income, has all the eclat for which swank Sutton Place is famed.

Past. Sutton Place and the circumscribing properties have long been a prime example of New York City's strange mixture of the sublime and the ridiculous. Ever since Civil War days when that acreage was the ornate estate of Clipper Trader Effingham B. Sutton, it has been the gold coin amid many copper ones, fringed in the early days by Portuguese rooming houses, later by the Consumers' Brewery, the Doelger Brewery and the Doelger tenement block. While Sutton Place increased in value tremendously during the Twenties with the hegira to its environs of the Vanderbilts, Morgans and followers, its neighboring properties became more tawdry, more deserted. One of these copper pennies was the Doelger tenement block which had been vacant since 1932 and up to its recent \$130,000 polishing.

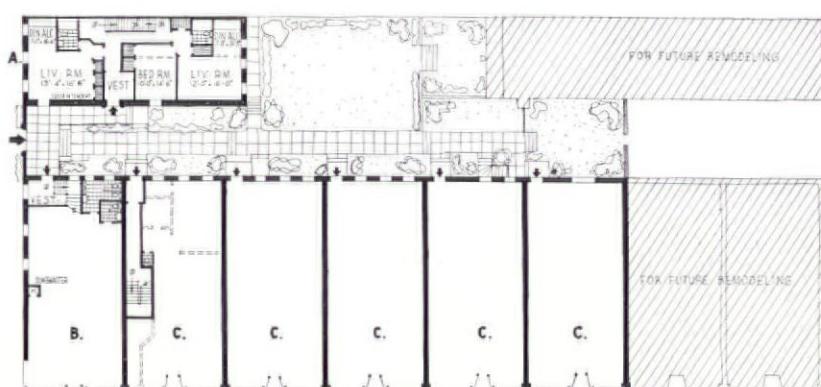
Polish. While exterior modernization was comparatively simple, all the wreckers left of the interior were the floor beams, stairs and masonry walls. First major structural alteration was reversing the entrance stair-



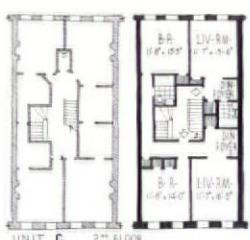
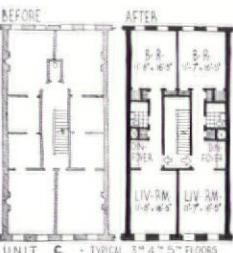
UNIT A - TYPICAL 2nd-3rd-5th FLOORS



UNIT B - TYPICAL 3rd-4th-5th FLOORS



Seven tenement buildings comprise the remodeled Sutton Mews, but exterior renovation was extended over two adjoining buildings to unify the whole block front. Major interior alteration was the relocation of the building entrances from the busy street to a quiet landscaped courtyard. As before, stores occupy the first floor level. They will add to the \$20,000 net annual apartment rental income.



ways from busy, commercial 1st Avenue to the rear of the building. Thus, instead of having individual entrances down long dark corridors, the houses now open on a single garden court, whose grilled gateway on 56th Street is now guarded by a uniformed concierge.

Next major interior alteration was the replanning of each long, slim toiletless cold water flat into two compact fully equipped living units. New plumbing was installed, new floors were laid, new partitions were erected. An oil-fueled central heating unit, thermostatically controlled, was provided in the basement of one building.

The resultant apartments are models of efficient renovation, contribute kudos to the ingenuity of Architect Walter S. Schneider. The smallest 1½-room apartment has a 12x16 ft. living room, a pullman kitchen concealed behind a venetian blind, a dining foyer, tiled bathroom and a large closet. Gray-green walls, white venetian blinds on all windows, built-in tub, shower, medicine chests, clothes hamper, electric fireplace and an inter-connecting house phone complete the apartment's modern appointments. Hallways are similarly styled with colorful wallpaper, grilled banisters, red doors and linoleum flooring of simple design.

Exterior remodeling has contributed greatly in attracting the East Side's fastidious apartment hunters. Principal face-lifting was the removal of all cornices and the erection of a single parapet wall atop the street side of the building. Painted steel gray and trimmed in white, the eight buildings now have a continuous facade, look like one structure.

Most attractive feature of Sutton Mews is the landscaped garden court which is

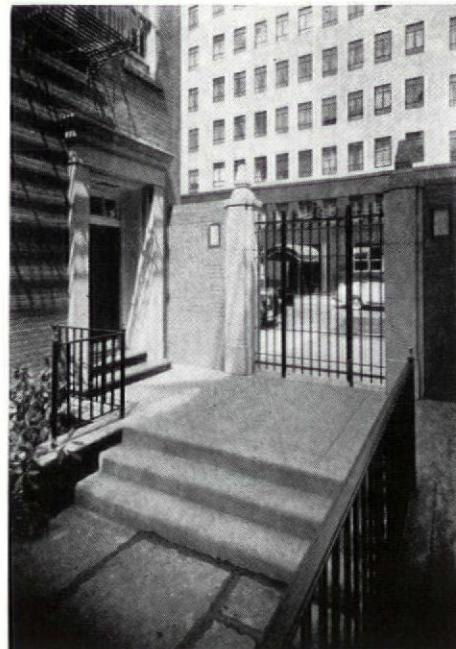


ENTRANCE SIDE

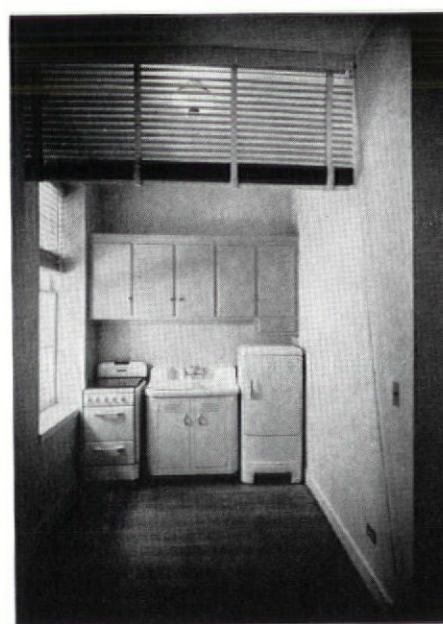




GARDEN COURT



ENTRANCE



now the entrance to each apartment building. Wide gray flagstone walks and the green of the lawn and garden are complemented by the vined gray-green side walls of the court. Flowers bloom in small gardens, will probably be cut to decorate another feature of Sutton Mews, a community cocktail-lounge-playroom in one of the basements.

Though Owner Doelger's expenditure on the garden was obviously high, it has proved a valuable investment, since: 1) it has become an important factor in tenant acceptance, 2) it carries out to best advantage the theme of "town conveniences and country atmosphere."

Prices. One departure in Sutton Mews from the traditions of Sutton Place is the matter of rents. Though they bring much more income than the \$18-22 per month per apartment of the old Doelger flats, the present Mews' rentals— $1\frac{1}{2}$ rooms at \$37.50, $2\frac{1}{2}$ rooms at \$50, $3\frac{1}{2}$ rooms at \$67.50—are much lower than other apartment rents in this high priced neighborhood. Seemingly, the combination of attractive apartments and comparatively low rentals has proved successful at Sutton Mews. With gross income from the 59 units at about \$37,000 and estimated gross expenses totaling approximately \$16,500, the probable net income remains a handsome \$20,000. And, this return will be boosted further by revenue from the first floor stores, occupancy of which has not kept pace with the residential units.

First of the many Doelger properties to be altered, Sutton Mews may be enviously eyed by landlords of neighboring derelicts, may cause other coins on the East Side, both gold and copper, to be repolished.

"COOL A ROOM?

**-Why that's just ONE of the functions
of the G-E Room Conditioner!"**



IT CIRCULATES, conditions and re-circulates room air.

IT DE-HUMIDIFIES. Heat is removed, excess moisture taken out.

IT MUFFLES. Filters and insulation deaden outside noises.

IT FILTERS. Removes dirt, odors, smoke from air.

IT GIVES FRESH AIR. Fresh air is introduced, heat transferred outside.

Each G-E Room Conditioner is custom built in every detail, too! Covered with antique leather like fabric—rich in appearance! Three different models.

Turn to G-E, too, for cooling a group of rooms, conditioning the whole house . . . or commercial buildings. Look in Sweet's Catalog ²⁶, consult your local Classified Telephone Directory for local G-E Distributor, or write to General Electric, Div. 713, Bloomfield, N. J.

GENERAL  ELECTRIC

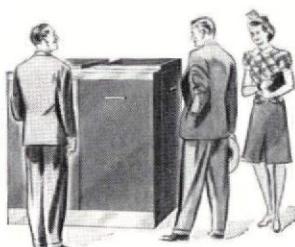
TURN TO 



**...for the complete line of
Heating and Air Conditioning**
(Here are typical examples)

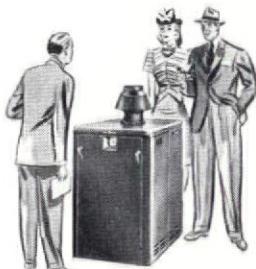


G-E Oil Furnaces— (steam, hot water, vapor) seven different sizes for various heating capacities. Year 'round domestic hot water coil optional.

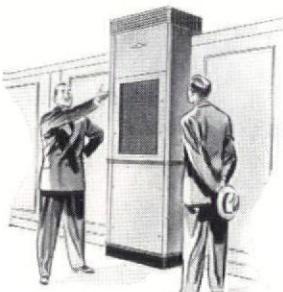


G-E Winter Air Conditioners— (oil or gas fired) circulates warm, clean, moistened air. A single switch provides summer circulation. Cooling equipment can be added.

G-E Gas Furnaces— for residential, commercial and industrial applications. Capacities range from 76,000 Btu output per hour to 1,372,000 Btu per hour.



G-E Unit Air Conditioners— for low-cost air conditioning in shops, restaurants, offices, etc. Complete range of sizes. Low in cost. Little or no duct work needed.



YOUR CLIENTS *will echo* WHAT THIS USER SAYS!

You make sure of clients' satisfaction when you specify Kinnear Rolling Doors . . . architects have been proving that to themselves for almost half a century! And the most convincing evidence of this fact is found in the enthusiastic approval expressed by so many users. Here, for example, is a recent letter from the Hydraulic Press Manufacturing Company, of Mt. Gilead, Ohio:

"Our new plant has been in operation approximately eight months. We have had in mind for some time letting you know what satisfactory service your product has been giving us.

"Our Kinnear Doors, both large and small, are operated very satisfactorily by hand and motor. It is a satisfaction to know that no matter what weather conditions may prevail these doors will operate smoothly and efficiently.

"Just recently the writer was discussing our Kinnear Doors with Mr. Meyers, one of our Shipping and Receiving Clerks, and it is very interesting to note the opinion of a man who uses these doors constantly. The features he praised most were the speed with which the doors operate, their adjustable height, heavy rugged construction, and last but by no means least, they are entirely out of the way when open."

*Get these Door Advantages
IN YOUR PLANT*

WRITE FOR DETAILS
The KINNEAR Mfg. Co.
1640-60 FIELDS AVENUE
COLUMBUS, OHIO



KINNEAR ROLLING DOORS

MONTH IN BUILDING

(Continued from page 4)

dise their newly built "Glenbrook Village," sponsored "House and Home Time," a fifteen-minute WJSV program based on stories behind famous songs of home. Written and directed by Harry R. Daniel of enterprising advertising firm Vincent Tutching and Associates, the program undertook a complete selling job. Soon many listeners were inspecting the program's "Radio Model Home" and Glenbrook Village became a well-populated subdivision. Then Newbold included a second subdivision in the radio promotion program—West Chevy Chase, which had failed under the direction of another company. Result: "Sales away ahead of last year."

Success of "House and Home Time" precipitated other real estate radio clients, resulted in another program, "Homes on Parade." Again authored by Adman Daniel, the program is designed to create an authentic real estate atmosphere, to engender home ownership in the listeners' minds. Actual interviews with prominent real estate men lend authenticity; carefully selected transcribed music provides lighter entertainment. Though originally a 30-minute feature the rush of new realty sponsors (now fifteen builders and brokers) has increased the program to a full hour.

"Homes on Parade" has proved extremely successful, when measured either in actual sales, inquiries or record-breaking crowds drawn to the various developments. Examples: Bradmoor Subdivision, after sales had languished, sold six homes in four days. Waverly Taylor, Inc., selling homes at \$15,000, drew numerous inquiries.

Since 1922 when Queensboro Corporation, Long Island real estate firm, staged a program over WEAF pointing out the advantages of living in Jackson Heights, there have been few successful real estate features on the air. First real impetus to new experimentations in real estate radio advertising came in 1935 when FHA asked cooperation in publicizing its Insured Mortgage Plan. Though FHA radio material was well prepared and free, results were not encouraging except in a few cities—notably Houston, Chicago, San Francisco. However, stemming from this attempt came last summer's first realty program by Washington's WJSV. It featured a commentator, Elinor Lee, who plugged five model homes for twelve participating material dealers, builders and developers. The program had several headaches but sold 110 homes, served as an effective trial balloon to Washington's present real estate radio programs.

Now, with smooth philosophizing on the comforts of home owning, inside dope on house values, the Capital's radio listeners have come to think of "House and Home Time" and "Homes on Parade" as authoritative sources of local home buying counsel.

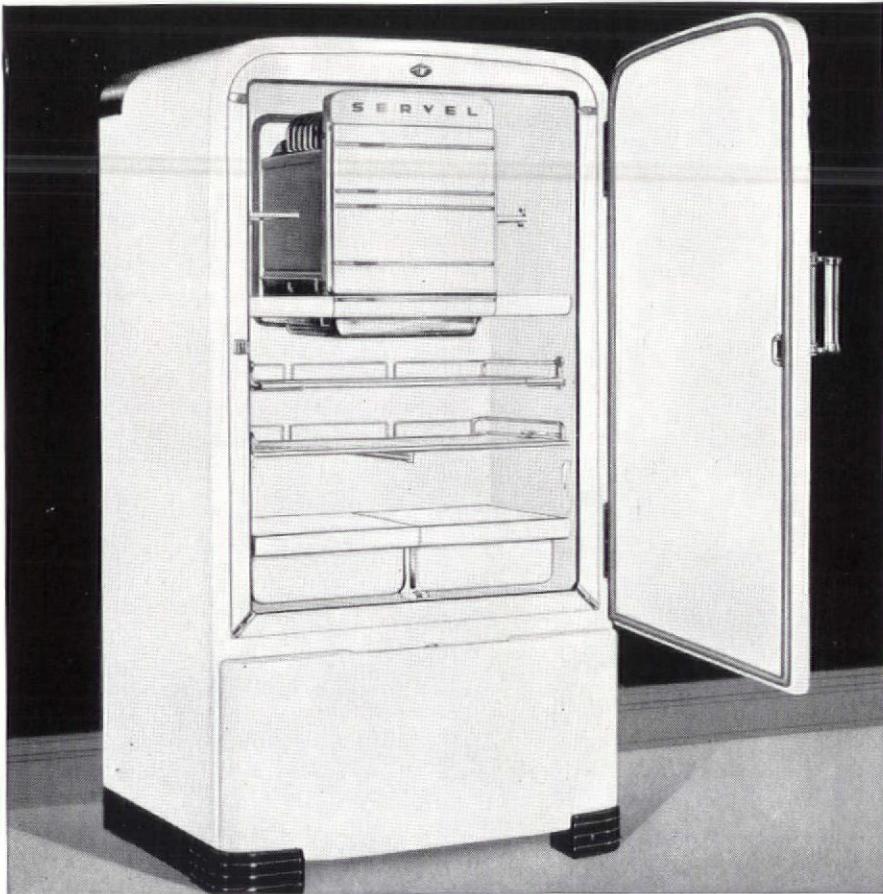
(Continued on page 36)

TIP TO
BUILDERS WHO
WANT TO KEEP
TENANTS
HAPPY

**GIVE 'EM THE ONE THAT
STAYS SILENT
LASTS LONGER**

Different FROM ALL OTHERS . . .

- NO MOVING PARTS in its freezing system
- PERMANENT SILENCE
- CONTINUED LOW OPERATING COST
- MORE YEARS OF SATISFACTORY SERVICE
- SAVINGS THAT PAY FOR IT



**CHANGE TO SILENCE
CHANGE TO SERVEL**

Builder:



"I've bought a thousand Gas Refrigerators for my buildings. That's what I think of Servel Electrolux, and its freezing system with no moving parts! You're absolutely positive of permanent silence, continued low operating cost."—Mr. Gustave Kellner, 851 East 19th Street, Brooklyn, N.Y.

Tenant:



"I find the operating expense a dollar a month, have never had any expense for service or service parts. Like its silence and absence of moving parts."—Mrs. Simeon Anderson, 5348 N. Christiana, Chicago, Ill.

Stays silent...lasts longer

SERVEL
ELECTROLUX
Gas
REFRIGERATOR

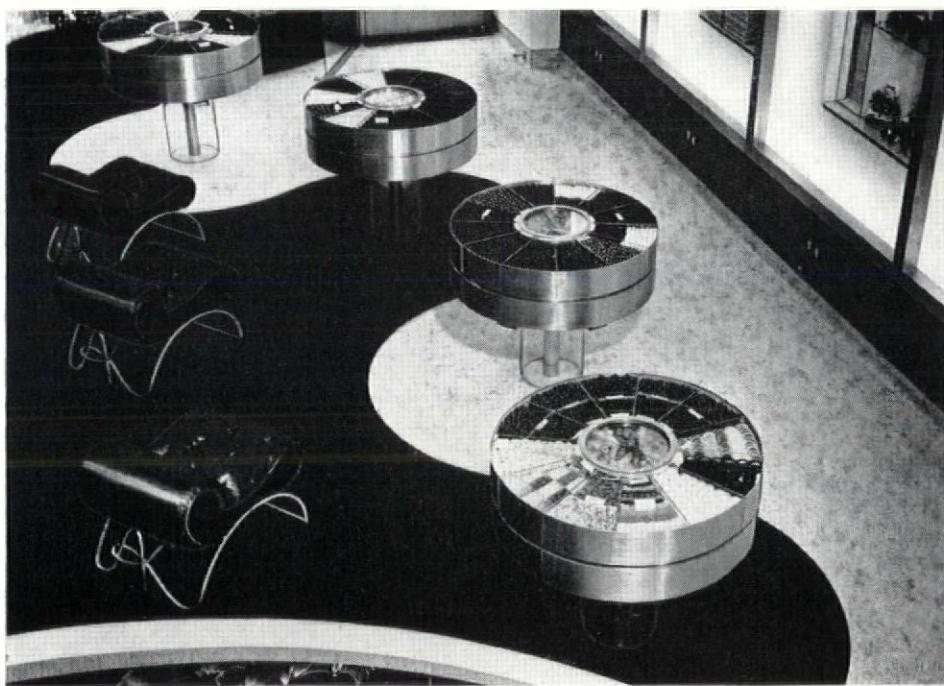
In stores, let the floor help you DISPLAY THE DISPLAYS

YOU'LL find a double-barreled store-design idea in this striking picture of Fifth Avenue's Altman & Kuhne Candy Shop. First, note how the new approach to display-fixture design effectively presents the merchandise. Second, note how the shrewdly conceived linoleum floor design *displays the displays*.

Here is a good example of the way Armstrong's Linoleum is being used to play a definite part in selling. Because you have more than 200 colors and patterns to choose from . . . and be-

cause the assistance of Armstrong's own specialists in floor design is at your disposal . . . you'll find it easy and economical to adapt this material to the needs of your commercial clients.

If you want to see some of the new things that are being done with linoleum in stores and other nonresidential buildings, a copy of our color-printed brochure *Better Floors for Better Business* is yours for the asking. Write now to Armstrong Cork Company, Floor Division, 1203 State St., Lancaster, Pennsylvania.



Long-lasting, easy-to-clean floors of Armstrong's Linoleum do a display job in the Altman & Kuhne Candy Shop on Fifth Avenue, New York. The colors are Black Plain Linoleum No. 27 and Ivory Marbelle Linoleum No. 032. Contractors: Ross-Frankel, Incorporated. Designers: Gruenbaum & Krummeck.

ARMSTRONG'S FLOORS LINOLEUM

Rubber Tile - Linotile (Oil-Bonded) - Asphalt Tile - Cork Tile - Linowall Wall Covering

MONTH IN BUILDING

(Continued from page 34)

BOMB INSURANCE

Chaos and disaster have always activated Britain's building booms. Another large scale English building program may have received its impetus recently when Parliament passed the War Damage Act. Publicized in the U. S. by the Federal Home Loan Bank Board, the Act is described as a compulsory insurance measure. Covering real estate damage losses for the first two years of World War II, it will in effect establish a gigantic reserve fund to help rebuild bombed England after the war.

Both the government and all individual home owners will make premium payments. Government's contribution will be up to a maximum equaling the total of private premiums. Since private property in England is usually held by several partial interests—i.e., owner, ground landlord, lender—private contributions will be based, according to the Act, on a sliding scale of contribution apportionments, depending upon the income value of the property and the share of ownership by each partial owner.

In execution, the Act fixes each contributed premium for non-farm property generally at 10 per cent of the annual income tax value of the property. On this basis, estimated private premiums will total \$800 million. With the possibility, if damage is particularly severe, that the Government will contribute an equal amount, the estimated total of \$1.6 billion will build 3 to 4 per cent of England's combined real estate and movable industrial assets, i.e., plant equipment, fixtures, etc.

Most important feature of the Act is the provision that the bulk of the damage compensation, based on building prices of March 1939, will not be paid until after the war. Thus, with the premium payments acting as forced savings, the Act will help stem inflation during the war, will stimulate post-war business, will facilitate planned rebuilding.

The Act's passage marks the first time in Britain's housing history, when destruction has struck, that action has been taken before the disaster's end. The Shaftesbury Act (1851) outlining public responsibility for slum clearance came after 1848's cholera plague. The House and Town Planning Act, which accounted for the building of over 200,000 homes, came as a post World War I plank in Lloyd George's "Homes for Heroes" campaign in 1919.

Encouraging is the fact that in the present chaos one of England's most important problems, reconstruction, is already being solved, that in planning their post-war pattern the British are not "muddling through."

Want Dependable Fluorescent Lighting Fixtures?

get **FLEUR-O-LIERS!**



How to be sure about FLUORESCENT LIGHTING

Specify **FLEUR-O-LIER** fixtures . . . certified by world-famous Electrical Testing Laboratories as meeting 50 rigid specifications set up by MAZDA lamp manufacturers to assure better light and better service.

They're GUARANTEED! Certified FLEUR-O-LIERS are guaranteed by their manufacturers to be free from any defects in materials, workmanship or assembly for 90 days.

You get a WIDE VARIETY! Choose from over 100 different industrial and commercial FLEUR-O-LIER designs—now available to help you get fluorescent lighting fitted to your specific needs.

Get GOOD ADVICE. Be sure your fluorescent lighting is properly installed. Your local lighting company will be glad to give you expert advice on how to get the most out of your investment in fluorescent.

And when you buy fluorescent fixtures insist that they carry the FLEUR-O-LIER tag at the right.

FLEUR-O-LIER
Manufacturers

Participation in the FLEUR-O-LIER MANUFACTURERS' program is open to any manufacturer who complies with FLEUR-O-LIER requirements

Choose Certified Fleur-O-Liers

for
Flicker Correction
Durability and Safety
Ease of Maintenance
Efficient Lighting Performance
Dependable Ballasts and Starters
High Power Factor (85% or over)—
and 44 other rigid specifications

LOOK for this tag

Insist on it!
It identifies
Tested, Certified,
Guaranteed
FLEUR-O-LIERS



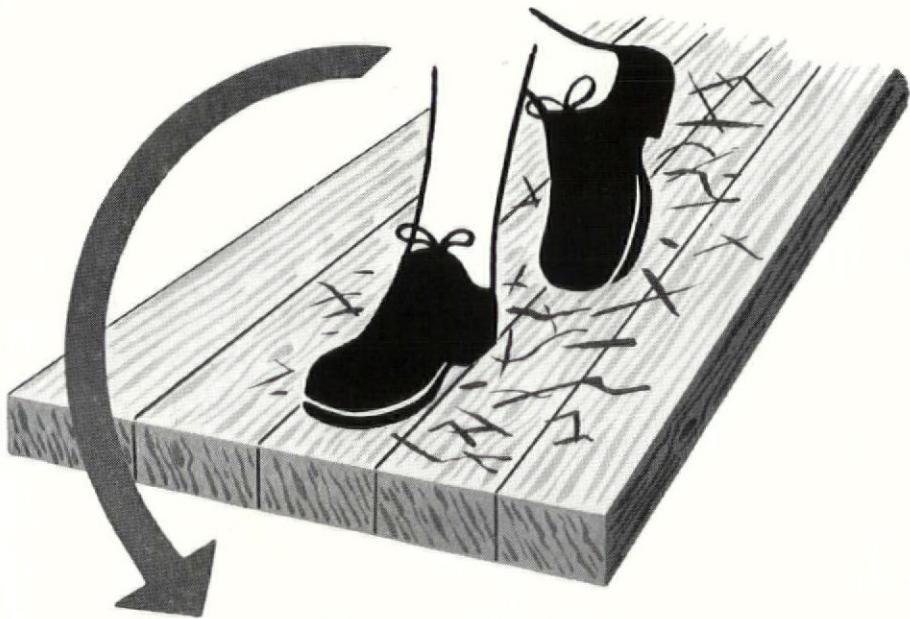
TEAR OUT AND MAIL

Fleur-O-Lier Manufacturers • 2119 Keith Bldg., Cleveland, Ohio
Please send me FREE new booklet "50 Standards for Satisfaction," together with list of Fleur-O-Lier manufacturers.

Name _____

Address _____

City _____ State _____



How a little boy's shoes can mar your reputation

When Bobby does an Indian war dance right on the living room floor, do you get complaints the next day? Does the home-owner say "Hey, Mr. Architect, look what happened to my floors! Is that what you call wear?"

The architect who wants to make sure the floor finish he specifies will stand punishment, will look good, not just when it's new, but after years and years of tough wear—specifies *shellac*.

How to keep a home-owner happy



When you specify shellac, you protect yourself from every possible complaint. Shellac is *quick-drying*, so dirt and grime won't spoil it during work. It's better-wearing, and won't show scratches as easily as other finishes. It's *more durable*, will keep in good-as-new condition longer, and is easily re-patched without lap marks. It's *attractive!* You can get the smartest styles in finish with shellac—dull, or rich and satiny.

Things you ought to know before you specify shellac

If you want shellac to give a perfect finish, make sure you write *proper application* into your specifications. Authoritative specifications for the reference of architects have been compiled and published. You can get a free set for your files, complete with all the information you'd like about shellac, by writing to

SHELLAC INFORMATION BUREAU
65 Pine Street • New York City

AIRPLANE PLANT

(Continued from page 4)

the roof of the main building. (Not so easy to camouflage would be the plant's accessory buildings and parking area.) Sabotage preventatives include controlled floodlights on the plant's walls and extensive fire alarm, signal and inter-communicating telegraph and telephone systems.

Light and ventilation requirements of the North American plant, in view of its complete ARP precautions, are extensive. To meet the former, the designers specified the installation of 7,000 fluorescent fixtures at a height of 12 ft. above the floor. Each comprised of three 48 in. 40-watt tubes, they produce an average of 26 foot-candles on the working plane. Power for this mammoth fluorescent system comes from 50 lighting transformers plugged into the network of bus ducts which blankets the entire shop. Larger transformers in the line between the power house and the bus duct are housed in the nine penthouses projecting above the roof.

In addition to the electric service from the local public utility company, the plant has its own emergency power generation station comprised of three 1,000 kw. diesel generators. Both services feed into a common switchboard in the power house where seven electric motors with a combined horsepower of 3,500 operate the compressors. Scale of the electrical installation is readily grasped by contemplating some of its vital statistics: 49 miles of conduit, 152 miles of wire, 120 tons of transformers and 18 tons of copper bus in 16,250 ft. of bus duct.

Calculated to produce an inside air temperature of 84° (dry bulb) and a relative humidity not exceeding 45 per cent at an air infiltration rate of not less than 160,000 cu. ft. per minute, design of the air conditioning system is based on shutdown operation during which no auxiliary heat can be counted on from personnel and connected power. The system is comprised of four centrifugal compressors to produce chilled water at 45°F. which circulates to cooling coils and fan units in the nine roof penthouses.

Proof and effect. Both North American and the Army are well satisfied with the unusual design and construction of the new Texas plant and the ease with which it was built. To-wit: on March 8, North American's President J. H. Kindelberger took a chromium plated spade in hand, broke ground in Kansas City for another Government-owned plant. It will be of the same construction, essentially the same design, a little bigger. Not only does it represent a further step in industrial decentralization but a new step in aircraft production. About 60 per cent of the bomber parts to be assembled in North American's Kansas City plant will be produced by General Motors.

Decorated with Daylight!

*PC Glass Blocks contribute daylight
and beauty to Westmore Apartments,
New York City*

(ARCHITECTS: BOAK AND PARIS)



EXTERIOR APPEARANCE of PC Glass Block panels is smart and modern. In a dwelling place their use is likely to result in a greater appeal to prospective tenants. The agents for this new apartment report it already 98 per cent rented.

ARCHITECTS find in PC Glass Blocks a material that is versatile in the extreme. These blocks, in their eight patterns and three sizes, are unusually attractive in appearance. They transmit daylight generously, preserve privacy, reduce heating, cleaning, maintenance and lighting costs. They insulate effectively against outside noises. They are relatively new and interesting to the public. And they are suitable for use in almost any type of building construction, from modest home to skyscraper. Send the coupon for our free book, which contains many illustrations of actual applications of PC Glass Blocks, as well as information on physical properties, construction details, and other specific data you will find helpful.

"PITTSBURGH" stands for Quality Glass and Paint

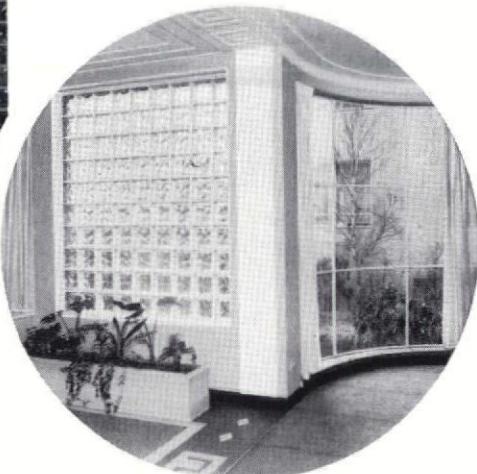


GLASS BLOCKS

Distributed by

PITTSBURGH PLATE GLASS COMPANY
and by W. P. Fuller & Co. on the Pacific Coast

PC GLASS BLOCKS were generously used in the attractive new Westmore Apartments, New York City. Adding to the good looks of the lobby as well as increasing the amount of daylight which enters it, panels of glass blocks were alternated with clear glass casements.



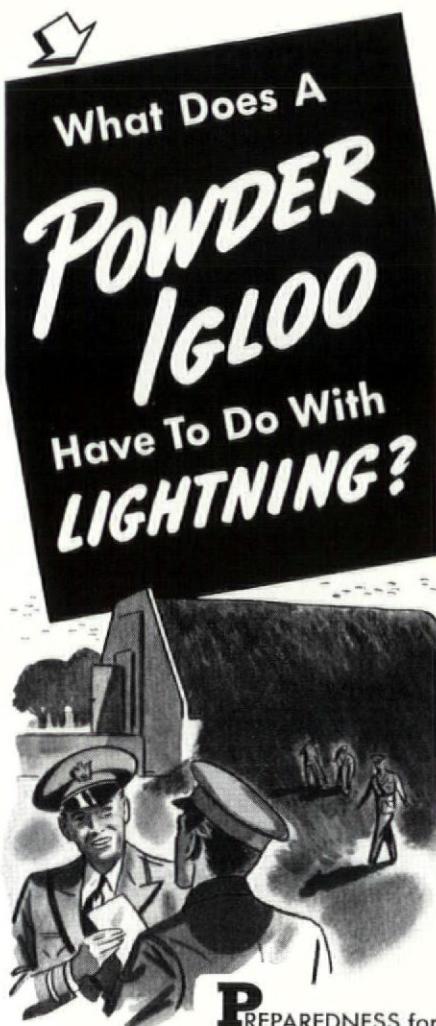
COMBINING PRACTICAL QUALITIES of insulation, easy cleaning, and protection of privacy with their light-transmission and appealing appearance, PC Glass Block panels are becoming increasingly popular in every type of construction. This panel was attractively placed in juxtaposition to a bay window looking out on the garden of the apartment.

Pittsburgh Corning Corporation
2157-1 Grant Bldg., Pittsburgh, Pa.
Please send me, without obligation, your free, illustrated booklet about the use of PC Glass Blocks in factories commercial and public buildings.
(Be sure to indicate type of building)

Name _____

Address _____

City _____ State _____



PREPAREDNESS for national defense makes many demands; the construction of powder igloos for ammunition storage included.

You can't take chances with ammunition...so the igloos must be as safe as human ingenuity can make them. Lightning is among the hazards.

West Dodd is playing a leading role in installing lightning protection systems on powder igloos...just as West Dodd is taking a leading role in the protection of other national defense projects against lightning.

The same reliable lightning protection is available to everyone at modest cost...for home, country building or factory. It is a sensible precaution against what the National Board of Fire Underwriters classes as a leading cause of fire. West Dodd can add an almost invisible lightning protection system to standing buildings, or build a concealed system into new ones.



WEST DODD
LIGHTNING CONDUCTOR CORP.
420 LEXINGTON AVE., NEW YORK CITY
GOSHEN, INDIANA

LOW RENTAL PROJECT

(Continued from page 66)

were fitted with skids temporarily nailed to their sills.

When the weather-delayed excavation and pouring of concrete foundations had been completed at the rate of one house every two days, Contractors Severson-Schlitz began moving the houses to the site on trucks fitted with special frames into which panels were locked vertically for safe delivery. Completion of each house from the foundations up required about six working days: one day for erection of all panels; two days for application of trim, rough plumbing and wiring, roofing and sheet metal work; three days for painting and installation of plumbing and electrical fixtures (including a two-burner electric range) and the oil-fired heater.

As shown in the cost breakdown (p. 67), total construction cost of each house comes to only \$1,745. For their commendably simple designs and their cost reducing efforts all along the line, Architects Beatty and Strang charged \$50 a house. Other expenses which brought the sponsors' capital investment up to \$2,280 per house were \$175 for a lot averaging 8,000 sq. ft. in area, \$60 for landscaping (which along with variation in the houses' orientation was relied upon to add interest to the standardized designs), \$110 for utilities, \$100 for movable equipment, and \$30 for miscellaneous items.

In calculating the \$23 per month rentals, the sponsors estimated the project's operating expenses, then worked backwards from the desired 2 per cent net return on their cold cash capital investment. Project operation in the hands of A. Roy Myers Co., Madison realtors, is fixed at \$22 per unit per year, and the sponsors confidently hope that, with tenant cooperation in maintenance of the house, total estimated operating costs, at \$161 per year, will not be exceeded, that rents will not have to be upped. If and when this hope is realized, other dwellings may be added to this project.

Meanwhile, twelve Madison families selected generally from the \$800-1,200 income bracket and on the basis of their needs, social inclinations, etc., will enjoy the benefits of private enterprise's lowest rent project. Breadwinners in these fortunate families, including those occupying the two experimental houses, are an airplane mechanic, two maintenance men, one machine operator, two warehouse men, two clerks, two truckdrivers, a welder and a bookbinder.

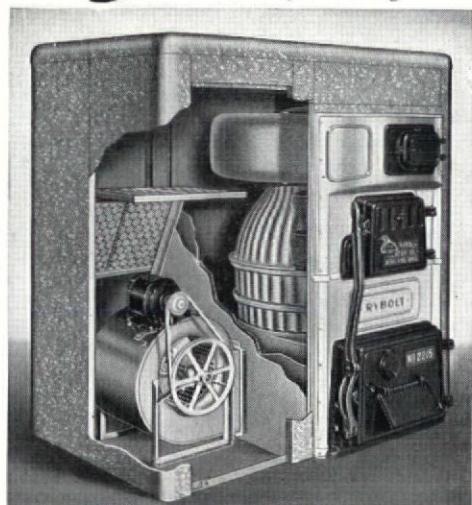
With the completion of this low rent but money making project, Madison has at least partially justified the refusal of the City Council two years ago to accept and participate in the development of a \$500,000 U. S. Housing Authority project whose low rents would have been obtained by heavy local and Federal subsidies.

RYBOLT

The **COMPLETE** Line of
WINTER AIR CONDITIONERS and
WARM AIR FURNACES

• The RYBOLT line is *complete*. It includes every type of warm air heating unit needed to meet the requirements of the finest dwelling or the modest low cost home, at prices to correspond. For automatic heating there's a choice of an interesting variety of RYBOLT winter air conditioners with modern features of the most advanced type. For the smaller house and more limited budget there are the RYBOLT gravity furnaces which represent the culmination of a quarter century of fine furnace building. RYBOLT heating units come in cast iron or steel... fired by coal, gas or oil. In modern efficiency,

economy, comfort and convenience they measure up to the high standard you have set for the homes you design.



SERIES 151—FOR MODERN AUTOMATIC HEATING SERVICE

Formerly Series 157, this unit has been redesigned to make it more compact and attractive. At the same time a new high in operating efficiency, convenience and economy has been achieved. The full height reversible blower cabinet can be placed on either side of the unit. The blower is of ample size to permit running at relatively low speed, insuring quiet operation. Has the Rybolt Series 15 Cast Iron Coal-Fired furnace for its heating element. Hammerloid enamel finished cabinet. 4 Sizes.

**Write for Folder
"The Complete Line"**



THE RYBOLT HEATER CO.
617 MILLER ST. • ASHLAND, OHIO

MR. ARCHITECT...I want to make sure you know about my new White Lead Paint



White Lead has helped many a house...and many a man... live on to fame!



Since the nation was born, Pure White Lead has protected homes from their worst enemy, the weather. Down through the years have come gleaming Cape Cod Cottages...proud Colonial Mansions — historic monuments to White Lead's durability and to those who kept those structures in good repair.

If these houses could talk, many an old New England home would tell you—"Design for the centuries...protect with White Lead". This means specify Dutch Boy — now available not only in the regular paste form but also as a ready-to-use paint.



Specify DUTCH BOY WHITE LEAD

Here's the proven protection
of Pure White Lead, in a new form
Ready-to-use!

Now! The famous Home Defense of the Minute Man, in a new up-to-the-minute form — Dutch Boy Pure White Lead Paint! It's pure white lead—all ready to spread! In 2 forms—Exterior Primer and Outside White—especially designed to give a real white lead job on new or old wood with 2 coats. You have never specified a 2-coat combination that gives better sealing and hiding. In addition this new Dutch Boy provides the whiteness, gloss and finish you need to put the crowning touch on your finest work.

Remember, whichever you specify . . . the regular Dutch Boy Paste White Lead or the new ready-to-use paint...you will be sure of getting the proven protection and beauty that have made Dutch Boy a synonym for paint quality.



NATIONAL LEAD COMPANY
111 Broadway, New York; 116 Oak St., Buffalo;
900 West 18th St., Chicago; 659 Freeman Ave.,
Cincinnati; 1213 West Third St., Cleveland; 729
Chestnut St., St. Louis; 2249 24th St., San
Francisco; National-Boston Lead Co., 800 Albany
St., Boston; National Lead & Oil Co. of Penna.,
1376 River Ave., Pittsburgh; John T. Lewis
& Bros. Co., Widener Building, Philadelphia

A Line of Roof Ventilators that Gives You "Everything"

In style or size, there's a
Swartwout VENTILATOR
to bring you success in
licking each ventilation
job in industrial
or commercial buildings



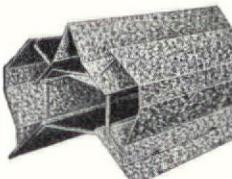
SWARTWOUT ROTARY

Built along ultra-modern lines, with efficiency and economy proved in over 35 years service.



SWARTWOUT AIRJECTOR

A fan ventilator with the basically correct principle—high capacity and low operating cost. Used wherever power ventilation is desired.



SWARTWOUT DEXTER HEAT VALVE

The original continuous opening ventilator. Provides large opening at relatively small cost. Ideal for heat and smoke removal and general ventilation.

Swartwout Engineers are available for personal consultation without obligation. Write for complete data.

THE SWARTWOUT COMPANY
18617 Euclid Avenue • Cleveland, Ohio

Swartwout
VENTILATION SPECIALISTS

HEADWAY AND HEADACHES

(Continued from page 12)

cork and steel to the vital defense material list under mandatory, industry-wide control. And, Defense Housing Coordinator Palmer set up a special department to handle building material priority information and to recommend action in specific cases.

► To Congress went a draft of a bill to carry out the President's request for a defense highway construction program, including \$100 million for access roads to military and naval reservations and defense industrial areas and \$25 million for main trunk highways of strategic importance.

► Beginning a 30-day drive to raise \$10.8 million for the construction of 350 service clubs for the armed forces and defense industrial workers, the United Service Organizations bombed New York City with promotional leaflets. Architects Ely Jacques Kahn and Robert Allen Jacobs designed two USO club houses (see renderings, p. 12) announced that the program's first unit would be built at Fort Dix, N. J.

► Acting Commissioner Howard O. Hunter revealed that his WPAsters were building and improving 84 civil airports which have been taken over by the Army Air Corps. (The Air Corps in addition has 55 airports of its own, bringing the total to 139.) WPA is also building and improving some 200 other airports which the Army has designated important to national defense. One of the biggest WPA jobs is at the Air Corps' Litchfield Park (Ariz.) Airport where ten carloads of cement a day are required to feed the concrete mixers.

► Through the House went the Cole Bill to authorize construction of pipelines connecting U.S. oil fields with the Atlantic Coast. It encourages construction via private capital, but permits the President to use Federal funds if necessary.

► Whopping contracts covering additional munitions facilities were announced by the War Department for Parsons, Kan. (a \$35 million shell loading plant), Texarkana, Tex. (a \$45.5 million shell loading plant), and Chattanooga, Tenn. (a \$39 million TNT plant). Cost estimates cover land, construction and equipment.

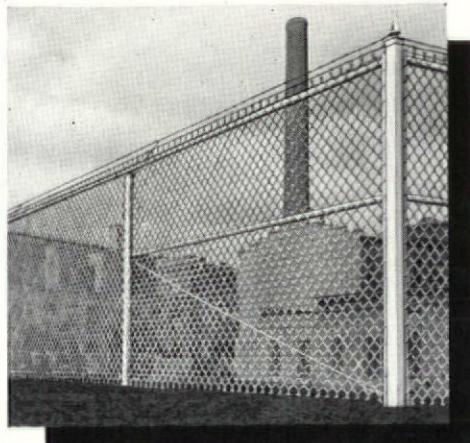
► To care for the Army's sick, 13 general hospitals containing 13,758 beds are to be ready by year-end. Four were already established prior to the current emergency, six were recently completed, and three are under construction. In addition, the Army has 133 post hospitals on its various military reservations throughout the country.

► As evidenced by bids on Army contracts, plywood prices were upped 5 per cent in September, 6 per cent in January and another 5 per cent last month. Latest evidence was the bid on 60,000 sq. ft. of $\frac{3}{4}$ in. exterior plywood for Army use in Milan, Tenn. It prompted Federal Price Boss

(Continued on page 44)

Specify Effective SABOTAGE PROTECTION

Anchor Chain Link Fence



WITH war conditions abroad, and actual instances of sabotage in industry at home, every architect should be prepared to specify effective sabotage protection for industrial plants now standing and under construction.

The experience of the last war shows that these three steps give adequate protection against outside and inside saboteurs with minimum expense for guards and policing. 1. An Anchor Fence completely surrounding the entire plant property. 2. Separate Anchor Fence installations surrounding outside storage yards and unwatched buildings. 3. Anchor Fence enclosures around vital parts of the plant such as power plants, transformer stations, chemical storage, laboratories in order to keep out all except specially designated employees.

Anchor Fence Engineers are glad to give architects the benefit of their experience in helping plan effective fence installations to assure maximum protection against sabotage. Mail coupon for the Anchor Industrial Fence Catalog today—and for the name of your nearest Anchor Fence Engineer.

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IRON PICKET

RUSTIC WOOD

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6635 Eastern Avenue, Baltimore, Md.
Please send me Anchor Industrial Fence Catalog and name of nearest Anchor Fence Engineer.

Name _____

Firm _____

Address _____

City _____ State _____

This is one of a series of outstanding homes designed by architects in which Andersen Lifetime Window Units have been specified.



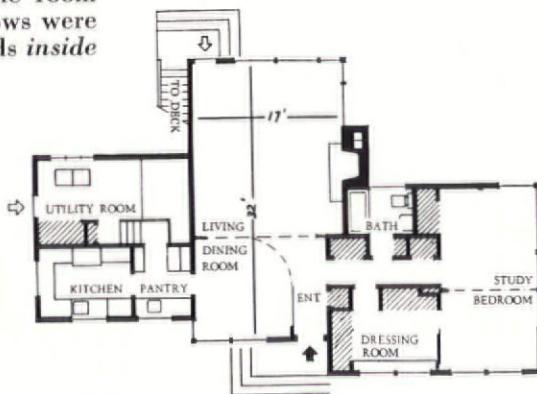
Designed by MALCOLM E. LEIN of LEIN, TUDOR and BEND

ANDERSEN HORIZONTAL GLIDING WINDOW UNITS ACHIEVE SPACIOUSNESS IN THE WALKER ART CENTER "IDEA HOUSE," IN MINNEAPOLIS, MINNESOTA

To demonstrate the most progressive ideas of fenestration in the home, the architects of this, the first Art Center-sponsored home in America, chose Andersen Horizontal Gliding Window Units.

The reasons for this choice are aptly stated in the Guide to the Idea House: "The most important 'idea' of the house is spaciousness . . . the use of large windows for view and sun and smaller windows where ventilation is of primary interest should be noted . . . the large windows on the south with the interior flower boxes create the feeling that the garden is a part of the house and accentuate the spaciousness of the room . . . the size and shape of windows were determined entirely by the needs *inside* the house."

The Andersen Horizontal Gliding Window is a complete window unit. It is completely weatherstripped, and is suited to rigorous climates where weather-tightness is of paramount importance. This window is especially adaptable to large window areas, since it is not confined to sizes that can be counterbalanced or swung on hinges.



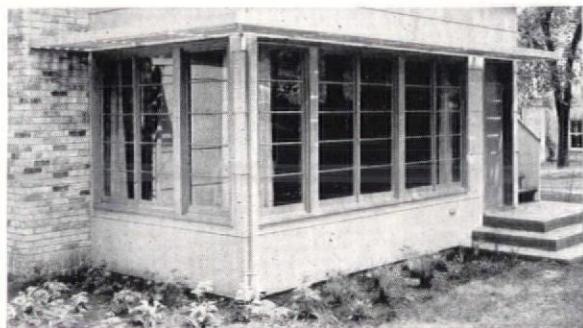
FOR FURTHER INFORMATION, SEE SWEET'S CATALOG, SECTION 15/24,
OR WRITE ANDERSEN FOR TRACING DETAILS AND SPECIFICATIONS.

Andersen Corporation

BAYPORT, MINNESOTA

CASEMENT WINDOW UNITS . . . NARROLINE (DOUBLE HUNG) WINDOW UNITS . . . BASEMENT
WINDOW UNITS . . . HORIZONTAL GLIDING WINDOW UNITS . . . MASTER WINDOW FRAMES.

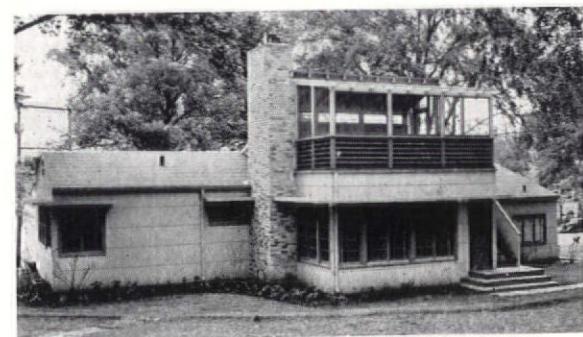
Advertisement



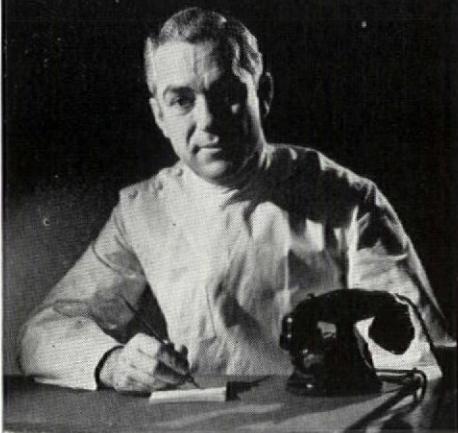
EXTERIOR OF LIVINGROOM demonstrates the superb contribution made to the design of the Walker Idea House by Andersen Horizontal Gliding windows.



INTERIOR OF BEDROOM, showing the use of a fixed-sash "picture" window flanked on each side by Andersen Horizontal Gliding Window Units.



PLAN SAFE STAIR TREADS AND WALKWAYS!



The surgeon sees the results of falls by slippery stair treads and walkways. Most accidents from this cause are preventable in both old and new buildings.

Complete protection is provided by ORCO SAFETY TREADS AND FLOORING. Even when wet, the abrasive action of the Alundum aggregate, firmly embedded and uniformly distributed in the rubber base, assures a positive grip to the feet. ORCO TREADS are non-slip throughout the surface, including the nosings.

Installation is simple and economical. Leading architects, builders and building owners are assuring permanent safety-under-foot with ORCO SAFETY TREADS AND FLOORING.

ORCO SAFETY TREADS AND FLOORING

CONTAINS
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ABRASIVE
AGGREGATE

For further information,
see our catalog in Sweet's

Refer to "Sweet's-12/8" for complete details, standard colors, specifications, lists of representative users and installation photographs of ORCO SAFETY TREADS AND FLOORING. Or, write for reprint copy of our catalog in "Sweet's."

THE OHIO RUBBER COMPANY
NO. 500 BEN HUR AVE. • WILLOUGHBY, OHIO

HEADWAY AND HEADACHES

(Continued from page 42)

Leon Henderson to ask plywood manufacturers to reduce their prices from \$30 to \$28 per 1,000 sq. ft. on the $\frac{1}{4}$ in. material and to shave all other plywood prices in the same proportion. Government also sought the courtesy of the 5 per cent jobber's discount which it receives on all other lumber purchases.

► Working with a \$15 million appropriation, the Army is surveying suitable sites for a possible expansion in its training camp construction program. Month ago, nine sites had been picked and the architect-engineers selected for the preparation of advanced layouts and plans: Blackston, Va. by Wiley & Wilson of Lynchburg, Va.; Augusta, Ga. by J. B. McCrary Engineering Corp. of Atlanta; Neosho, Mo. by Burns & McDonnell Engineering Co. of Kansas City; Fort Smith, Ark. by Black & Veatch of Kansas City; Columbus, Ind. by Charles H. Hurd of Indianapolis; Santa Maria-Lompoc, Calif. by Leeds, Hill, Barnard & Jewett of Los Angeles; Medford, Ore. by Myron Hunt and H. C. Chambers of Los Angeles and Blackie & Wood of San Francisco; Eugene, Ore. by John W. Cunningham & Associates and Lawrence & Allyn of Portland; Cookson Hills, Okla. by Holway & Cockrane of Tulsa. When and if constructed, the projects will cost about \$23 million each.

► Putting building trades workers on the back, the War Department announced that 500,000 men were employed at the peak of its Quartermaster Corps' \$1.2 billion construction program, but that only 14,875 man-days of the total of 40.6 million man-days were lost by work stoppage—just 0.03 per cent. The only serious delays were caused by labor troubles in the industries which supplied the building materials.

► To a showdown last month came the controversy over the use of cost-plus-fixed-fee or negotiated contracts by the Army's Quartermaster Corps. Congress has claimed that this type of contract is wasteful, expensive and automatically rules out the small contractor. The Army contends that on large construction projects, where an iron-clad construction schedule must be maintained and where high penalties are levied for delays, it is almost impossible to obtain bids for lump-sum contracts. The latter school of thought prevailed when the House last month considered an amendment to a War Department appropriation bill which would have outlawed the cost-plus type of contract, then killed it by the slim margin of four votes. Recent reports indicate that the Army will use the negotiated form of contract more extensively than was contemplated a few months ago.

► To offset the fearsome oil-shortage headlines inspired by Oil-Coordinator Ickes
(Continued on page 46)



WILLIAM R. MOORE SCHOOL, Memphis, Tenn.

Walk C. Jones, Jr. Architect
Leo F. Magnus, Memphis, Applier

Completely Waterproof from Foundation to Copings with MINWAX PRODUCTS

On the William R. Moore School shown above, Minwax delivered a complete waterproofing service. The following Minwax Products were used:

MINWAX MEMBRANE
WATERPROOFING
on Foundations

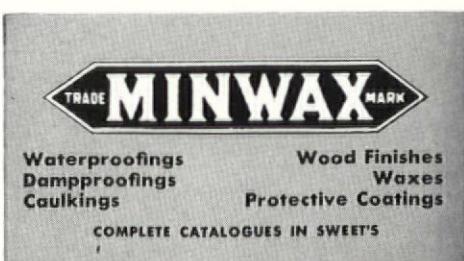
MINWAX FULL SEAL FABRIC
for Spandrel Waterproofing

MINWAX CAULKING
COMPOUND
on all windows

MINWAX CAULKING &
WEATHERCAP
for all coping joints

Minwax manufactures a complete series of waterproofing materials proved by over 35 years of successful use on outstanding structures in all parts of the country. We are prepared to offer you the benefit of this experience. It will assure your giving complete satisfaction to owners.

SEND FOR bulletin on Minwax Waterproothing Products. Specifications in Sweet's, Section 5, Catalog No. 21.





Facts you should know about Metal Lath...

INCREASES FLOOR SPACE. Metal lath construction with solid plaster permits strong partitions to be built in thicknesses of two inches. This construction added enough floor space in a hotel to bring in \$30,000 extra annual income.

LOW COSTS. In most communities 2-inch solid metal lath and plaster partitions cost no more than ordinary 2 x 4 inch wood and plaster partitions . . . and the savings in space permit substantial reductions in the cost of office buildings, stores, apartments, hotels and other buildings. By reducing outside dimensions, metal lath saved \$49,000 in an office building.

HIGH FIRE RESISTANCE. Metal lath and plaster partitions are now specially recognized by building codes because of the authoritative fire tests and superior performance in actual fires.

SOUND INSULATION. For 2-inch solid plaster and metal lath partitions the sound insulation in decibels is 37.7. This is better than most other common types of construction.

CRACK RESISTANCE. Metal lath partitions are rated

second only to reinforced concrete in crack resistance. Architects and builders use metal lath wherever the most severe cracking is likely to occur.

HIGHLY SANITARY. Modern seamless plaster and metal lath afford minimum lodgement of dust and grime. Rodents can't get through. It's termite proof.

REDUCES DEAD WEIGHT. Partitions of 2" solid plaster and metal lath weigh approximately 17.5 lbs. per square foot. Hollow partitions of metal lath and plaster weigh about the same. Other types of fire-resistant partitions run as much as 70% higher in weight.

Consider these many advantages. If metal lath construction is superior for the better homes and buildings and costs no more, why not use it on lower cost buildings? The 2-inch metal lath partition has been used almost exclusively on Federal Housing Projects because of its lower first cost and other advantages.

Metal lath made of U·S·S Steel is available from leading manufacturers throughout the country. Specify U·S·S for first quality.

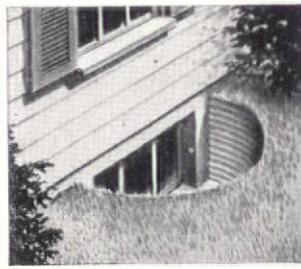
CARNEGIE-ILLINOIS STEEL CORPORATION, Pittsburgh and Chicago

COLUMBIA STEEL COMPANY, San Francisco

TENNESSEE COAL, IRON & RAILROAD COMPANY, Birmingham

Scully Steel Products Company, Chicago, Warehouse Distributors

United States Steel Export Company, New York



Steel area wall—made of "double-life" U·S·S Copper Steel. Quick to install, admits more light, reduces installation costs.



A lifetime cellar door bulkhead—Trim, strong, light, tight-fitting. Never warps, splinters or cracks. Built of U·S·S Copper Steel.



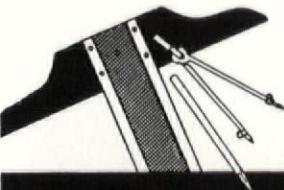
Underground garbage can—Put it out of sight, where it belongs. But don't forget it should be made of rust-resisting U·S·S Copper Steel.



New Paintbond gutters and downspouts—Borderized like the fenders of your car for long life and higher rust resistance. Can be painted immediately, saving return trips. In the South, specify U·S·S Dul-Kote Sheets.



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Open the door of an Eljer equipped bathroom—and you'll be sold once and for all time on Eljer beauty and Eljer design. Home buyers want attractive bathrooms—that's

why Eljer helps you to sell.



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Please send booklet "Fixtures of Beauty and Distinction"

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City _____ State _____

HEADWAY AND HEADACHES

(Continued from page 44)

(p. 63) and to bolster tail-spinning equipment sales, the Oil Burner Institute met in New York City a fortnight ago, declared a "war on waste," fired a counter-barrage of propaganda concerning plentiful oil supplies, gave the industry a war cry: "Keep the home fires burning first." Funds are being raised to finance a Washington lobby and to launch a program of reassurance and intelligent conservation along these four lines: 1) increases in the efficiencies of existing oil burner installations, 2) minimum commercial standards for all new installations, 3) more complete home insulation—see p. 63 et seq., 4) cooperation with large oil consumers in effecting other economies.

► Gaining speed, the Federal defense housing program opened more than 1,000 dwelling units during May's last week, approved almost 10,000 dwelling units for construction. At that time, a total of 96,753 units had been approved in 161 localities in 49 States and territories. Construction contracts had been let for 64,474 units in 132 localities, and 13,274 of these units in 52 localities had been completed.

► Interesting, in view of Government housers' original skepticism of prefabricated construction, is the large part this technique is to play in subsequent defense housing. Month ago, no less than 12,000 dwelling units had been officially approved for prefabrication. Most of them will be produced in new temporary shops located near the sites—comparable with the prefabrication facilities at the Avion Village project near Dallas, Tex. (see p. 5).

► Prodding bankers to participate increasingly in the low cost housing field, Defense Housing Coordinator Palmer reasoned with the convention of the District of Columbia Bankers Assn. that "by taking larger risks you can improve our chances of an early and satisfactory peace... You can easily get legislation that will widen your power to invest in housing and other defense work, if you will show your desire for it... By using a lower interest rate in housing construction, we can afford to reduce rentals or sales prices and in that way we can open up a whole new level of the market... If you want to stay in business, you have to have something to sell that people will buy. If the bankers don't have anything to sell except the use of burglar-proof vaults to hide money in, they will find themselves classed with the warehouse business. Running a warehouse is an honorable service, but will it pay for marble columns and a location in the financial district?"

► At the completion of Audubon Village, one of the FWA's defense housing projects near Camden, N. J. (ARCH. FORUM, May 1941, p. 341; June 1941, p. 442), the Borough of Audubon billed the Government for \$150,000—the estimated cost of

supplying municipal services to the project. Complaint is that the unwanted 500-unit development will require a new school, a \$100,000 sewage disposal plant, a trio of policemen and a 20 per cent boost in the cost of garbage collection and street maintenance. Government's offer of \$36,000 per year in lieu of taxes for these services was rejected on the grounds that this payment of \$72 per house was less than half the \$150 tax bill paid by Audubon's 2,300 other families.

► To expedite the biggest part of the defense housing program which clears through the Federal Works Agency, Administrator John Carmody recently established a new Division of Defense Housing within FWA, made Clark Foreman its director (see p. 8). The Division has been further divided into four sections: 1) Prefabricated Housing Section will handle all defense projects of this type, thus remove them from the fumbling hands of FWA's Public Buildings Administration, 2) Special Operations Section will handle all projects whose character is such that they cannot be entrusted to PBA or the U.S. Housing Authority—because of its size, the 5,000-unit, 14-project Pittsburgh development comes under the jurisdiction of this section. 3) Construction Review Section will act as watch dog over all defense housing construction agencies. 4) Management Section will handle the management and eventual disposition of all defense housing projects except those located on military posts.

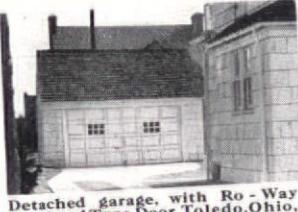
► Another encouraging sign on the Federal defense housing front is the fact that all projects under the wing of FWA's Special Operations Section will be designed by private architects. To date 21 architects have been commissioned for as many projects (some 6,500 units) in the States of Connecticut and Pennsylvania alone. Also benefitting by private architectural service are the ten projects (4,600 units) being directed by Col. Lawrence Westbrook, special assistant to FW Administrator Carmody. (For example, see p. 5).

► Defense housing by private enterprise also moved into high gear last month. After seven weeks of operation, FHA's Title VI program had accounted for some 12,500 dwelling units involving mortgage insurance commitments totaling \$50 million—just half the presently authorized total of \$100 million.

► Biggest Title VI news of the month was the launching of a 300-unit, \$900,000 project by the Houston Ready-Cut House Co. in its Texas home town. Comprising what will be known as "Clinton Village," the five-room houses will sell for about \$3,000 to local industrial workers. Claiming 10,000 houses to their credit, the Texas prefabricators have already participated in two other defense projects—\$675,000 worth of Army tent frames and a group of buildings for the Corsicana Air School.



This duplex apartment building, owned by Morris Marks, Salt Lake City, Utah, is equipped with two Ro-Way Overhead Type Doors.



Detached garage, with Ro-Way Overhead Type Door, Toledo, Ohio, residence of Ray Shaffner, Architect, Harold Spooner.



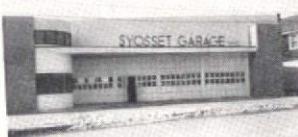
Attached Garage, equipped with Ro-Way "Two - Car" Overhead Type Door, Architect, Aldrich & Aldrich, Galesburg, Ill.



Ro-Way Overhead Type Garage Door in Bellevue Fire Station, Memphis, Tenn. Redlinger & Hanson, Contractors.



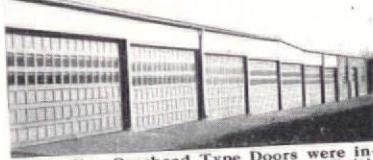
Ro-Way Overhead Type Door, 16' x 7'6", replaced another type of door when this home was purchased by John McNerney, Toledo, Ohio.



Syosset Garage, Syosset, Long Island, N. Y., equipped with 4 Ro-Way Overhead Type Doors. Krebs & Schulz, Contractors.



Eight Ro-Way Overhead Type Doors at American Car & Foundry Plant, St. Louis, Mo. L. O. Stocker Co., Contractors.



18 Ro-Way Overhead Type Doors were installed in C. D. Kenny Warehouse, Baltimore, Md. Kirson Construction Company, Contractors.

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When you write specifications for any Residential, Industrial or Commercial job, add the word "Ro-Way" to "Doors of Overhead Type", and get the extra values Ro-Way gives.

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Authorized Ro-Way Representatives in all principal cities offer expert service in the sales and installation of Ro-Way Overhead Type Doors.

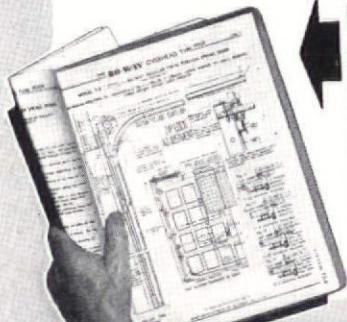
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These quiet, trouble-free Doors are really designed and built to enable a car owner to completely forget the mechanical parts, just as he is able to do in operating his fine car

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There's a Ro-Way for every Door way!

FORUM OF EVENTS

(Continued from page 14)

PRE-BUILT HOSPITAL

Among the less grim aspects of World War II are its effects on building, jolts which may yet produce technical changes of the first magnitude. Under the stimulus of mass demands for defense housing, U. S. prefabricators are working to capacity, expanding their plants to a size that may someday serve the needs of the large peacetime market. In the warring countries, the need for mobility and lightness has already produced structures with much more than military significance.



Wiae Worlc

electrical heaters, and a staff of 170, which can take to the road or be set up in a few

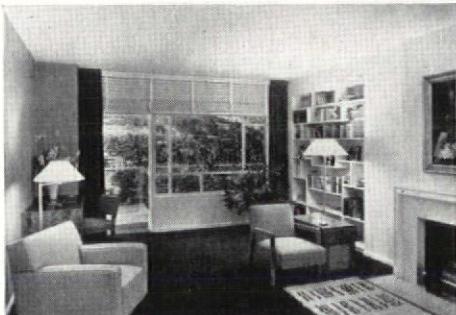


Wide World

workmen. There will be 125 beds in 22 buildings, with staff quarters for 84. Walls are of fireproof material, and in case of damage, any one of the wards in the hospital will be able to carry on independently of the others, as each will have its own light, heat and water.

DEMONSTRATION APARTMENT

Standard practice among New York apartment house builders is to aim for a completion date substantially ahead of October 1. As the overwhelming majority of the city's tenants rent from one October to another, the owner who passes moving day with empty apartments faces a virtual

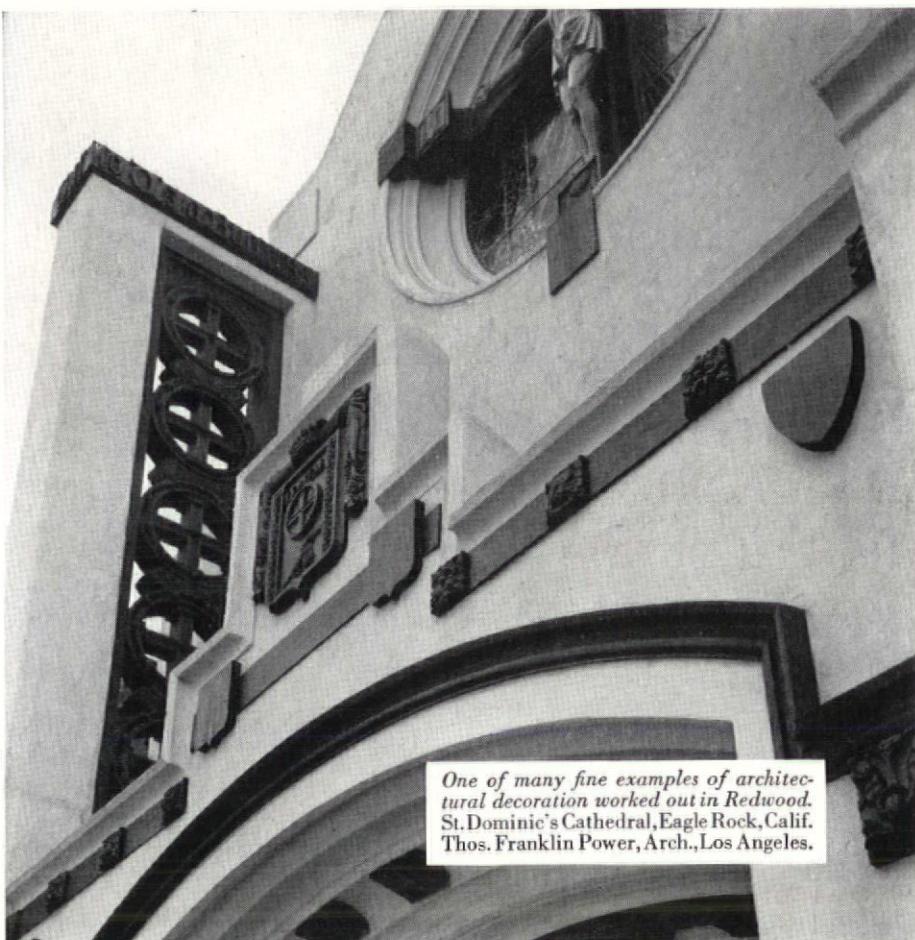


Samuel H. Gottscho

certainty of renting them later at a loss. The owners of 40 Central Park South, a 22-story reenforced concrete apartment building now going up in a high rental district between New York's midtown business center and Central Park, found that due to difficulties in closing their land deal, their building was not going to be ready to show more than a week or two before the October deadline. Partial occupancy seemed inevitable unless something drastic were done.

To Culver, Hollyday & Co., the renting agents, goes all credit for a scheme as unconventional as it has been successful. Space in a nearby office building was leased, and a complete apartment was built, decorated by Arnold Rummel, and furnished down to the last goldfish. Facing the picture window (see illustration) is a huge photomural of the view the tenant will enjoy. To date some 60 apartments out of a possible 130 have been leased.

(Continued on page 52)



One of many fine examples of architectural decoration worked out in Redwood.
St. Dominic's Cathedral, Eagle Rock, Calif.
Thos. Franklin Power, Arch., Los Angeles.

* You can depend on Redwood for faithful and lasting reproduction of your decorative ideas. For Redwood's smooth, even-grained texture assures easy workability and precision joinery. And Redwood's high resistance to shrinkage, twisting and weather keeps your designs intact through the years. Data on Redwood for architectural details and other uses gladly sent on request. California Redwood Association, 405 Montgomery Street, San Francisco; also offices in Los Angeles and New York City.

REDWOOD IS IDEAL FOR:

Siding	Picket Pack
Interior and Exterior Trim	Fencing
Foundation Stock	Log Cabin Siding
Underpinning	Gutters
Structural Timbers	Mouldings
Garden Uses	Paneling
Window Sills	Shingles
	Shakes

If you can't obtain Redwood easily
please write. We will tell you
how to get it.

Whatever the job... consider REDWOOD!



*You can work wonders in
Color and Design with
J-M ASPHALT TILE*



♦ The floor of this attractive florist's shop was designed from the three marbleized colors shown above: No. 127 (top), No. 125 (center), No. 102 (bottom).

If you're looking for greater freedom of expression in a flooring material, specify Johns-Manville Asphalt Tile. Its wide range of sizes and versatile color combinations have been designed to give your talents free play, regardless of the type of building or style of interior treatment.

You will find that J-M's modern, resilient flooring saves your clients money, too. It is low in cost, economical to apply . . . Yes, and J-M floors are easy to clean . . . retain

their original luster with little or no upkeep . . . resist hard wear through years of service. So, for smart floors that demand that hard-to-find combination of beauty, utility and economy, specify Johns-Manville Asphalt Tile on your next flooring job.

You'll find plenty of ideas to stimulate your originality in the new J-M Asphalt Tile Flooring brochure, "Ideas for Decorative Floors." For your copy, write Johns-Manville, 22 East 40th Street, New York, N. Y.

Johns-Manville ASPHALT TILE FLOORING

Wow!

Thin copper for concealed flashing—simple, effective and inexpensive

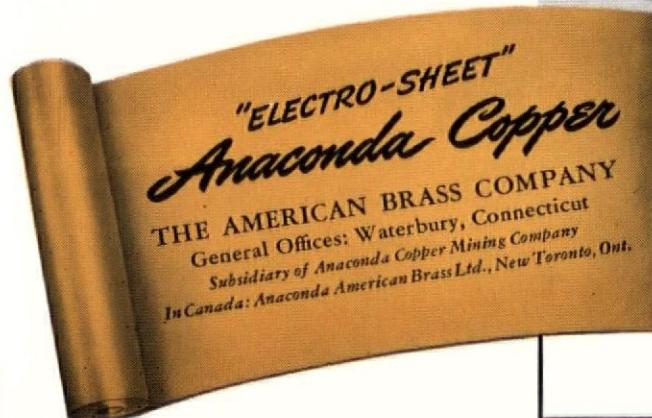
Anaconda "Electro-Sheet" Copper seals out air and moisture at corners, eaves, and other vulnerable points

Here is a new way to build-in the superior protection of copper at an amazingly low cost. Strong, durable "Electro-Sheet" Copper will not rust. It is impervious to water and air even under excessive wind pressures and it will not dry rot regardless of time.

When bonded to building papers, fabrics or asphaltic compounds, "Electro-Sheet" is extremely easy to install because it has the flexibility of paper, yet stubbornly resists kinking, breaking and tearing. This exceptional material is available in rolls of various lengths, and in widths up to 60"—with the copper in thicknesses of .0013", .0027" and .004" (1 oz., 2 oz. and 3 oz. per square foot).

Recent tests on sheathing papers showed that metallic products, including four reinforced "Electro-Sheet" types, were the only materials impervious to water and water vapor both before and after accelerated aging!

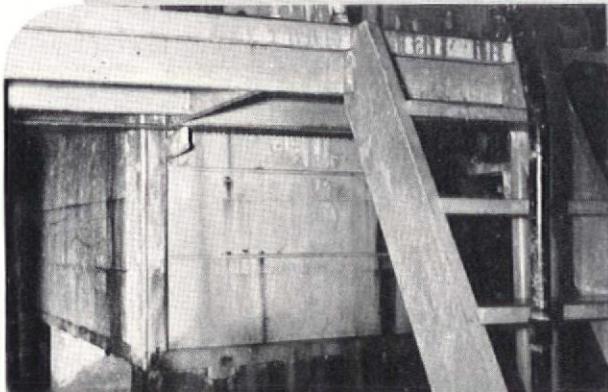
We make only plain "Electro-Sheet" Copper which is combined with paper, fabric and asphaltic compounds by other manufacturers. Samples of the finished products and names of manufacturers will be furnished on request.



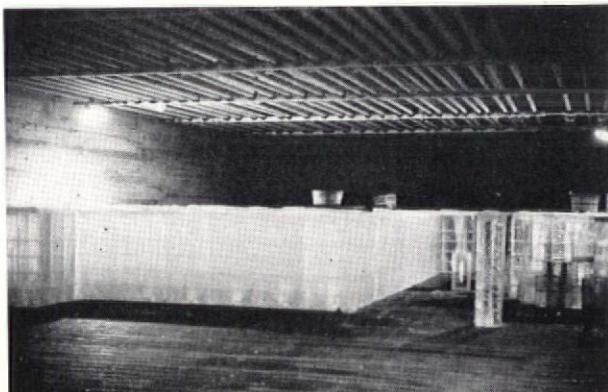
"Electro-Sheet" closing in corner of this building provides absolute protection against infiltration of air, dust and water at this vulnerable point. Similar protection is provided at the eaves, around doors and windows and for flashing drip caps. "Electro-Sheet" used here is a product of The Sisalkraft Co., 205 West Wacker Drive, Chicago; the house was built in Johnson County, Kansas. Harry L. Wagner is the architect, R. L. Falkenberg & Co., the contractor.

4196

SERVICE RECORDS PROVE WOLMANIZED LUMBER* HAS PLENTY OF *Plus*



Wolmanized Douglas fir stock head-box, platform, stairs and rails in a paper mill.



The Wolmanized Lumber lining of this ice storage room is sound after 10 years service.



These seats in Texas A & M's stadium, though fourteen years old, are in good condition.

"Show no favoritism!" With these instructions, investigators set out to get the low-down on Wolmanized Lumber's performance. Into the truly "tough" spots in industry they went, where ordinary lumber doesn't have a chance.

Their reports (available to you on request) cover these uses: wet process industries—docks, piers, boardwalks — railroad structures — bridges and highway structures—mine timbers—refrigeration plants—commercial buildings—sanitary works and water supply.

Over 21,000,000 board feet of Wolmanized Lumber were examined. Some of it had been in service for fifteen years. Yet, renewals because of decay amounted to less than 0.2%. What a service record that is!

In using Wolmanized Lumber, all of the advantages of wood construction are retained; it is easy to handle and erect, it is clean and odorless, and it can be painted. It is distributed through retail lumber dealers under the one name—Wolmanized Lumber. AMERICAN LUMBER & TREATING CO., 1647 McCormick Building, Chicago, Illinois.

*Registered Trade-Mark

Wolmanized **LUMBER**



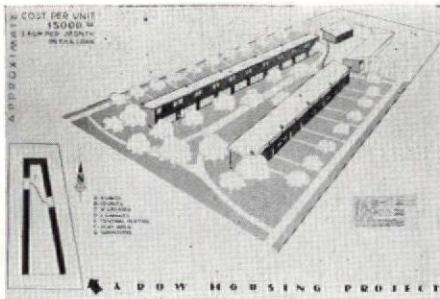
FORUM OF EVENTS

(Continued from page 48)

SCHOOL PROJECTS

Not the least encouraging part of the architectural school picture is the attention being given to problems that have meaning in the world of today. It is not many years since students who were destined to spend most of their lives on small houses, shops and alterations were working out the most fantastically grandiose projects for palaces of oriental potentates, art centers on the scale of Williamsburg, and similarly entertaining if useless subjects. The picture has now changed to the point where even the Rome Prize competitions

(see page 14) are concerned with airports and small community layouts, and this year's award in architecture went to a



building without a single classic order shown on it.

Typical of the current trend are the three illustrations, two of which show winning

Is It A Fact That Some Heating Distributes Germs?

ANY heat, using recirculated air, returning to the one main source of heat, to be reheated and recirculated, your common sense tells you, must be a distributor of germs.

"But," you say, "the filter takes out most of the germs and the high temperature kills off the rest."

But, it's the returning of the circulated cool air to the intakes, that does the germ distributing, just as it will spread odors from bath room or kitchen.

You can't effectually shut off a fan pushed warm air heated sick room.

The instant the door is opened, the pull of the recirculated fan pulled air to intakes, draws the air and germs from the sick room.

But with Burnham Radiator heat, each room is independently heated, with its own heat source. What circulation of air there is, is naturally and independent

of any other rooms.
It's apparent, therefore, that any germs
that do find their way out, are at least
not helped by the heating.

This germ question is a much mooted one. Here are the real facts. What does your common sense tell you? One thing sure, an overwhelming percent of hospitals are radiator heated. A fact that holds significance.

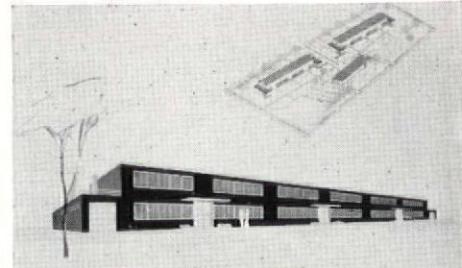
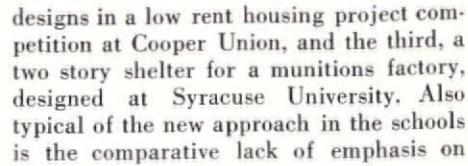
See Sweet's. See for yourself.

Burnham Boiler Corporation

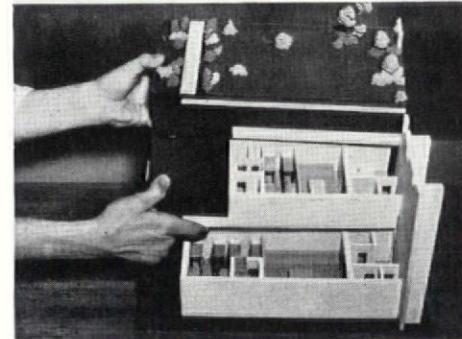
Irvington, N. Y.—Dept. J

Zanesville, Ohio—Dept. J.

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rendering in the drawings, and the growing tendency to use models wherever possible for both study and presentation. The



model shown is in three parts so that the arrangement on both levels can be examined without difficulty.

LARGEST FACELIFTING

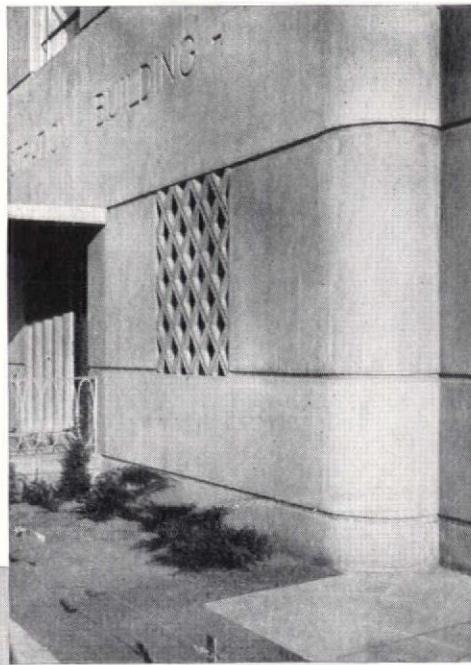
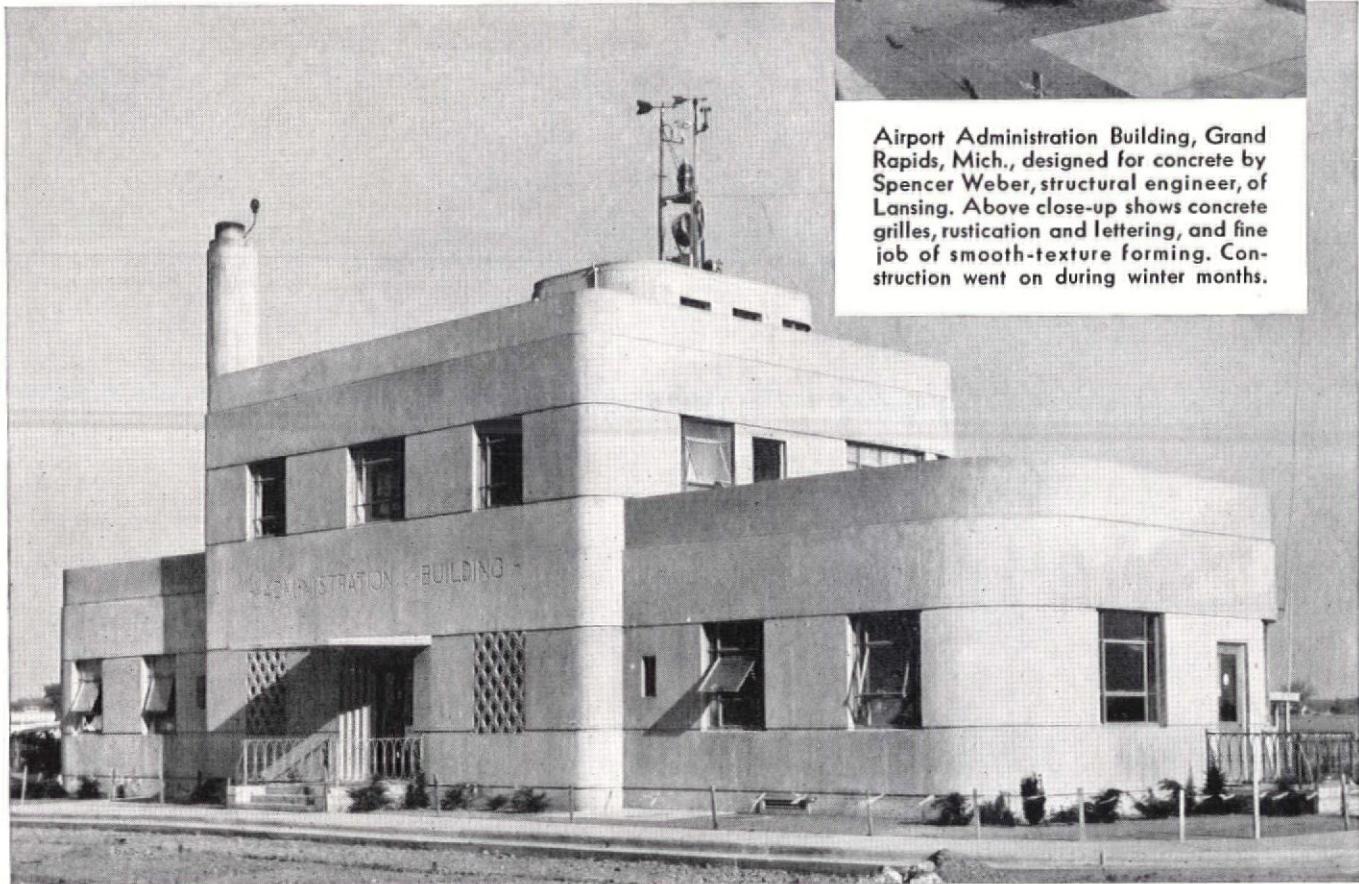
Madison Square Garden in New York, with a seating capacity of some 20,000, has been the scene of prizefights, political conventions, bird shows, ice carnivals and the circus. Generally the background for any of these remains substantially the same. When rented by Monte Proser for



his summer-long "Dance Carnival" it was decided to do over the enormous interior, and Designer Clark Robinson was given \$100,000 and 30 days for the design, construction and installation of equipment. The finished job, which was ready on schedule, includes eight 77-foot palm trees (with cocoanuts), a waterfall, three bars, three bandstands, a Pan-American Patio including a tropical cafe seating 500, an Enchanted Garden cafe seating another 500, a "sky" of silk netting, and, if Mr. Proser is lucky, 5,000 dancers a night.

(Continued on page 56)

Economical buildings,
as modern as air transport
with
**ARCHITECTURAL
CONCRETE**



Airport Administration Building, Grand Rapids, Mich., designed for concrete by Spencer Weber, structural engineer, of Lansing. Above close-up shows concrete grilles, rustication and lettering, and fine job of smooth-texture forming. Construction went on during winter months.

The vigorous, growing aviation industry has been quick to capitalize the advantages of concrete as a combined architectural and structural medium. Typical is the Grand Rapids Airport Administration Building, designed for concrete.

Adaptable to almost any shape or form, concrete permits walls, frame, floors and roofs to be cast as a unit in one firesafe, enduring material. First cost is moderate, maintenance low.

Ask your architect or engineer about concrete's possibilities for your public, commercial

or industrial building. Literature will be sent free on request in the United States and Canada.

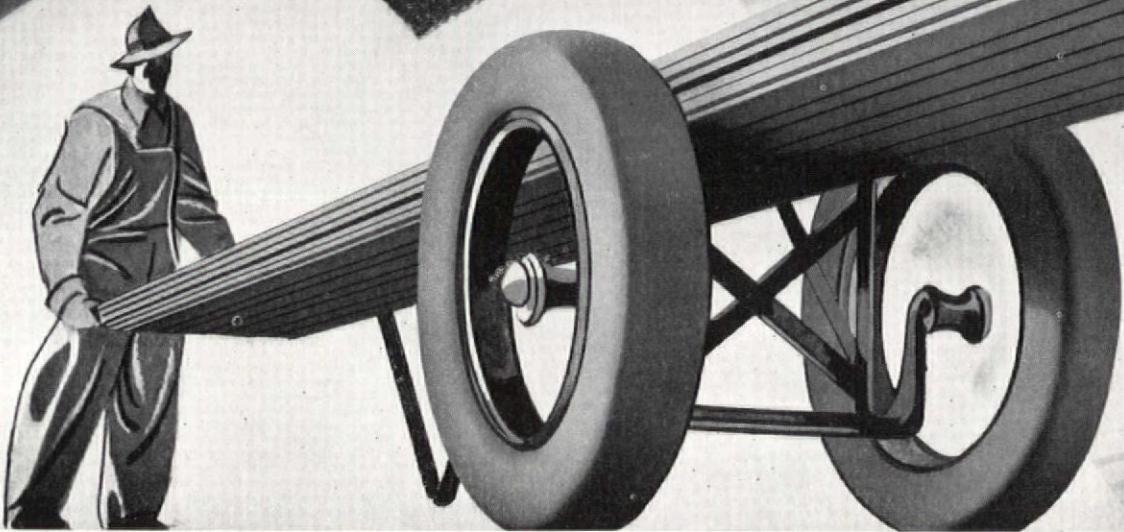
See Sweet's Catalog, Section 4-49

PORTLAND CEMENT ASSOCIATION

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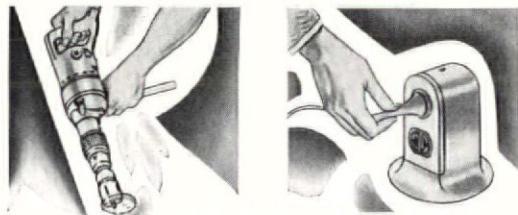
Architectural Concrete ...combining
architectural and structural functions in one firesafe, enduring material



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"Quick Change"

IS THE Q-FLOOR ANSWER WHEN ELECTRICAL OUTLETS ARE NEEDED ANYWHERE THIS YEAR, NEXT YEAR OR ANY YEAR AFTER.

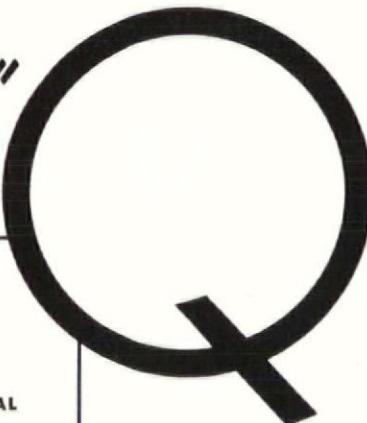


FROM THIS... ...TO THIS

in a matter of minutes!

The electrician simply cuts a hole in the upper surface of Q-Floors. This gives him immediate access to one of the Q-Floor Cellular wireways. In a few minutes he can install a new floor connection ready to plug in any desired electrical service.

Q-Floors offer 100% electrical availability. They are, in themselves, series of protected steel wireways which carry wiring for lights, business machines, buzzers, telephones and other electrical services to any 6-inch square over the entire floor.

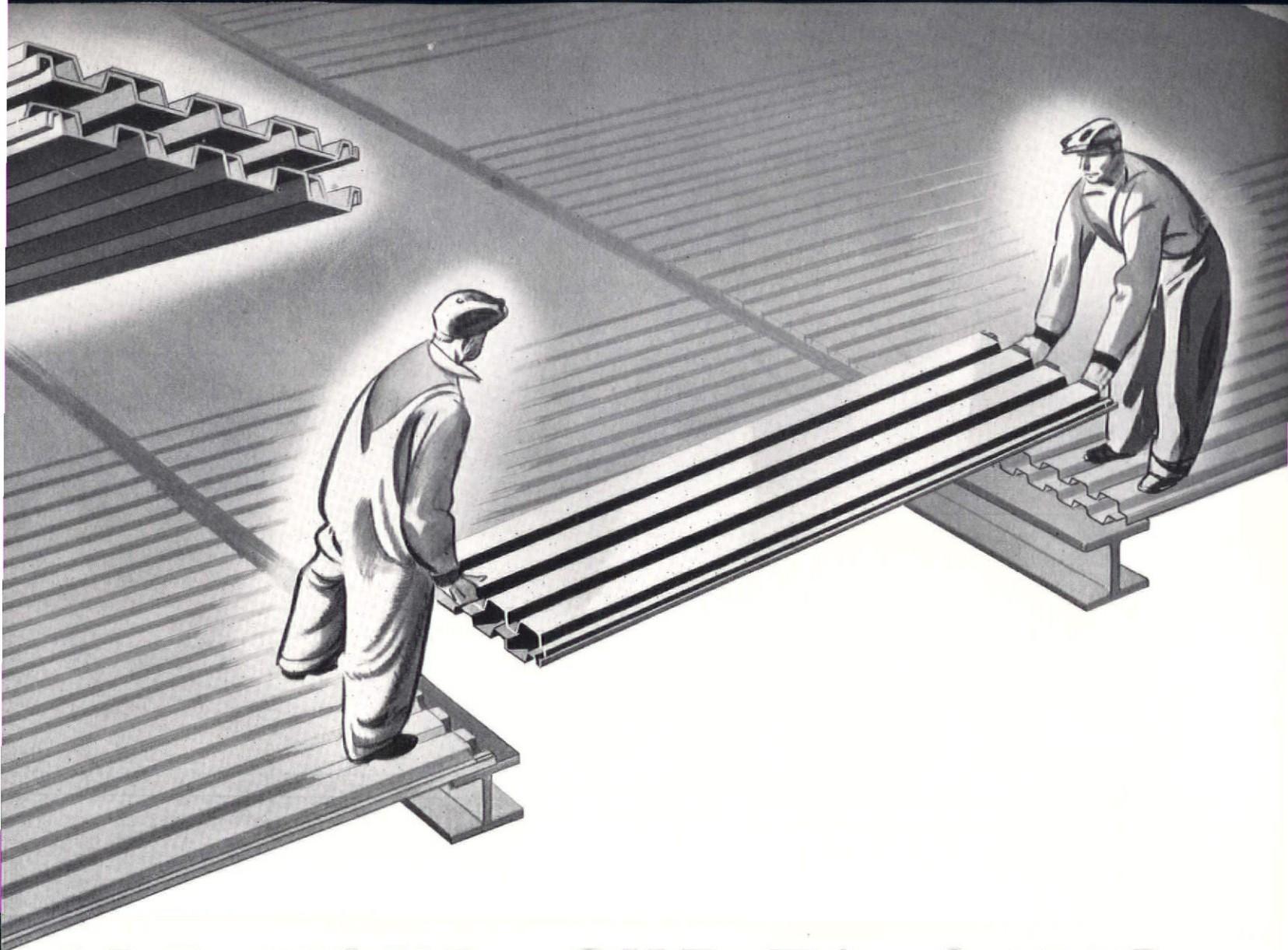


- FLOORS

- For years, "floor waiting" has been the bottleneck of building, as architects well know. On job after job, hundreds of workmen in every building trade have waited for hours and for days while one or the other slow-moving type of floor is being installed. Today, when Defense cannot wait, when more floor space is needed quickly, Q-Floors are the cue for speed!

Q-Floors, made in cellular steel sections, are quickly laid themselves . . . two men can place a 32 sq. ft. section in 30 seconds . . . and they immediately form a solid, safe platform upon which other trades, masons, plasterers, plumb-

ROBERT



ARE YOUR CUE TO SPEED

ers, electricians and air conditioning installers, can work, store materials and place scaffolding. No wooden floor forms or planking are required. No waiting for floor materials to dry out. Quicker completion of the job and quicker occupancy are assured.

Q-Floors are light in weight, yet they have amazing live-load capacity and substantially decrease dead weight over all floor areas. This means both savings in foundations and savings in structural steel.

The time and cost-saving advantages of Q-Floors can be applied to any type of build-

ing . . . commercial, monumental, public, industrial or home. In many types of Defense structures, Q-Floors are now reducing building time by weeks and months.

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and cost?

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QUICK-IN
SON Q - FLOORS
QUICK-CHANGE

FORUM OF EVENTS

(Continued from page 52)

AWARDS

Election of fourteen fellows to the American Institute of Architects for distinguished achievement in architecture was announced at the annual dinner of the Institute, held in Los Angeles. Those advanced to fellowship were: Gordon Allen of Boston, Mass.; Raymond J. Ashton of Salt Lake City, Utah; Leonard H. Bailey of Oklahoma City, Okla.; Frank N. Emerson of Peoria, Ill.; Robert K. Fuller of Denver, Colo.; Albert Harkness of Providence, R. I.; Lewis P. Hobart of San Fran-

cisco, Calif.; H. Roy Kelley of Los Angeles, Calif.; Roy F. Larson of Philadelphia, Pa.; Arthur Lamont Loveless of Seattle, Wash.; Loring H. Provine of Urbana, Ill.; Winsor Soule of Santa Barbara, Calif.; George Spearl of St. Louis, Mo.; Ernest Wilby of Windsor, Ontario, Canada.

Winner of the BOOTH TRAVELING FELLOWSHIP Competition in the College of Architecture and Design, University of Michigan, was Arthur Witt Brewer of Owosso, Michigan. The problem: "A Community House in a Medium Size City."

THE MCKIM FELLOWSHIP, bestowed every three years by the Columbia University School of Architecture, has been awarded to Rockwell K. DuMoulin, architect, of Providence, R. I., for continued research in rammed earth construction.

The School of Architecture of WESTERN RESERVE UNIVERSITY announces the award of the Charles Frederick Schweinfurth Traveling Scholarship to Howard Bruce Cain, Cleveland, Ohio. The scholarship is to be used for study and research in Mexico and Guatemala in the summer of 1941.

COMPETITIONS

THE AMERICAN INSTITUTE OF ARCHITECTS will offer a prize of \$1,000 for the best essay on art appreciation submitted in a nationwide competition, arranged in co-operation with the *Atlantic Monthly*. A second prize of \$500 will be awarded. The contest, financed by the Waid Education Fund of the Institute, is substituted this year for the lectures formerly supported by the fund.

EDUCATION

Beginning in September, 1941, the Architectural Department of PRATT INSTITUTE, Brooklyn, N. Y. will add a year of graduate study open to professional architects. Students may major in defense subjects, such as structural air raid precautions, camouflage and defense housing, or in community planning, residential design, landscape architecture, etc. A limited number of fellowships will be available.

The Graduate School of Design of HARVARD UNIVERSITY and the Cambridge Graduate School of SMITH COLLEGE will offer a collaborative summer session open to both men and women. Ten courses in architectural and landscape design are included in the six-weeks curriculum.

PERSONALS

The firm of MOORE AND LLOYD has been dissolved and Harvin Moore will conduct private architectural practice at 2006 West Alabama, Houston, Texas.

CHARLES IRWIN THIELE, architect, announces the removal of his office to 503 Third Street, Niagara Falls, New York.

The Whitney Publishing Company announces the appointment of Francis deN. Schroeder as Editor of INTERIORS. Mr. Schroeder was for many years an Associate Editor of *Vanity Fair*, *Time*, and *Life*.

ORGANIZATIONS

HARVEY STEVENSON was elected president of the New York Chapter of the American Institute of Architects, to succeed Frederick G. Frost. J. André Fouilhoux was chosen vice president of the Chapter, Robert S. Hutchins, secretary, Henry Hofmeister, treasurer, and Don E. Hatch, recorder. In addition to the new officers, Albert G. Clay and Otto Eggers become members of the executive committee.

ERRATUM

On page 76 of the May issue announcement was made of the appointment of Hans Knoll as sales representative to decorators and architects for Artek-Pascoe furniture. Mr. Knoll is contract representative in the metropolitan New York area only.

INDUSTRY
lives in a
Glass House



NEVER BEFORE has glass played such an important part in the development of industrial building.

Glass for windows, side walls, skylights and sawtooth construction. Glass for daylight, safety, and protection for skilled defense workers.

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for use in government building.

Economical to install — safe — fire retarding . . . it is ideal for all types of glass construction. More architects, plant owners, contractors and engineers are recommending Pennsylvania Original Solid Corrugated Wire Glass every day.

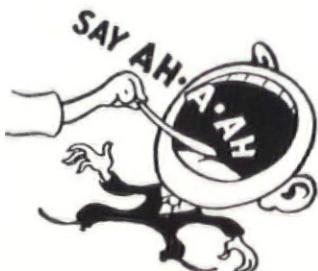
It Meets and Beats Requirements!

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THE SPENCER HEATING CLINIC

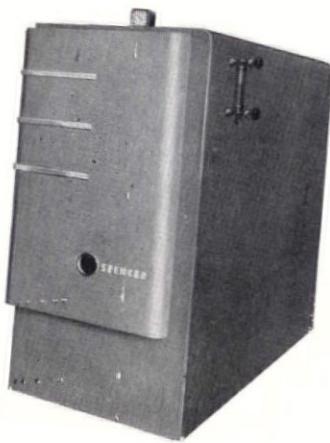
Highlights Needs for Progress

What was good in heating fifty years ago won't pass muster today. Spencer can point to 50 years of steady progress — pioneering many of the features which the building industry accepts as standard today. A typical example, shown below is the beauty jacketed boiler developed in the Spencer Laboratory and produced at competitive prices by Spencer's vast modern facilities.



PRESCRIPTION:

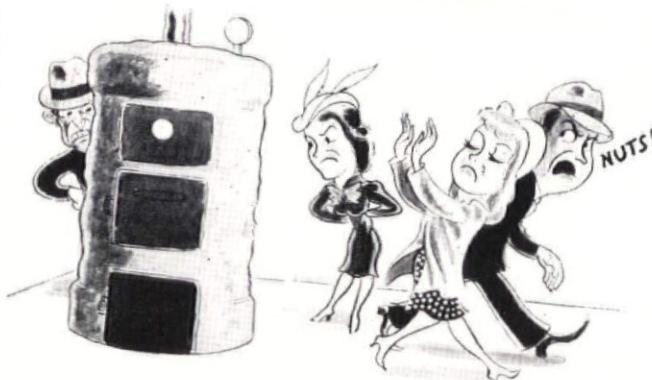
Architects and builders know that "the extra cellar room" for hobbies and fun sells new homes. So they specify Spencer "K" or "C" Boilers ranging from 400 to 1950 feet (steam), in conjunction with automatic heat. These boilers are *Beauty Jacketed* in smart metallic grey, trimmed with red. And they are as efficient as they look. Then there is the "A" Series. These also are modern steel tubular boilers ranging up to 42,500 feet (steam) for large structures. And the Magazine Feed Heater — justly famous for its great fuel savings and still the one type of automatic firing device without motors or moving parts. All are designed, built and guaranteed by SPENCER — and conservatively rated in accordance with S.H.B.I. standards. The specifier and owner have this double protection.



CASE: NOTED REAL ESTATE DEVELOPER RETIRES — DECIDES TO RUN PEANUT STAND!

DIAGNOSIS:

He pooh-poohed the idea that modern Spencer Beauty Jacketed Boilers would sell new homes. Lost plenty when prospects turned "thumbs down" on outmoded boilers and furnaces.



For Complete Information Send For the 1941 Catalogue
SPENCER HEATERS

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DIVISION-AVIATION MANUFACTURING CORPORATION

Illustrated: Spencer Beauty Jacketed "C" Steel Tubular Boiler from 700 to 1950 ft. (Steam). For oil, gas, stoker or hand firing.

SPENCER BOILERS

FOR EVERY TYPE OF BUILDING
AND EVERY TYPE OF FUEL



TRIPLE BENEFITS

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BRUCE Factory-Finished STREAMLINE FLOORING!

Factory-Finish is Part of the Wood!



Surface is uniformly finished on special machines at the factory — a job unequalled by ordinary methods! The finish penetrates the pores of the wood—stubbornly resisting scratching—chipping—peeling! The "Scratch-Test" proves it.

Ready for Use the Instant It's Laid!



Clients can move in several days earlier. Bruce Streamline requires no sanding or finishing on the job! Laid like ordinary strip flooring—available in Oak, Maple, Beech. Sizes: 25 3/8" x 3 1/4", 1/2" x 2 1/2", 3/8" x 2".

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BRUCE

STREAMLINE HARDWOOD FLOORING

(Trade-Mark Reg. U. S. Pat. Off.)



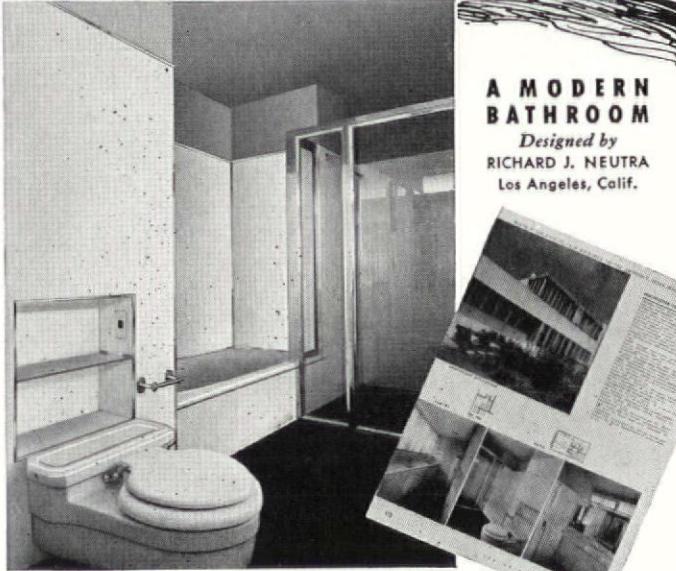
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Gentlemen: Please send FREE "Scratch-Test" panel and full details about Bruce Streamline Flooring.

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♦ In the luxury and thoughtful care given to the unusual design features so evident in this bathroom by Mr. Neutra, it is significant that Marlite was specified for the walls. Notice particularly how the architect used unbroken surfaces of the Marlite wall-size panels to enhance the spaciousness and modern simplicity of line. Marlite Pre-finished Wall Panels—available in more than 100 popular colors and patterns—offer you a scope of decorative adaptability for creating truly modern interiors in a degree unmatched by other types of wall materials. For further information, write—or see Sweet's 11/39.

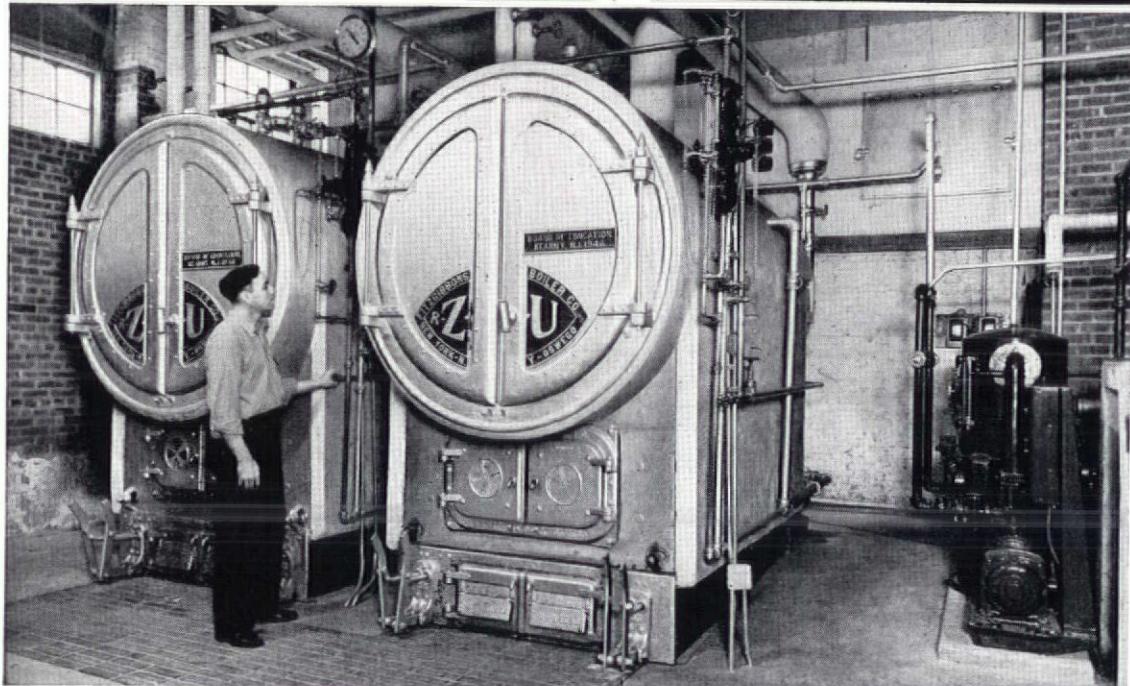
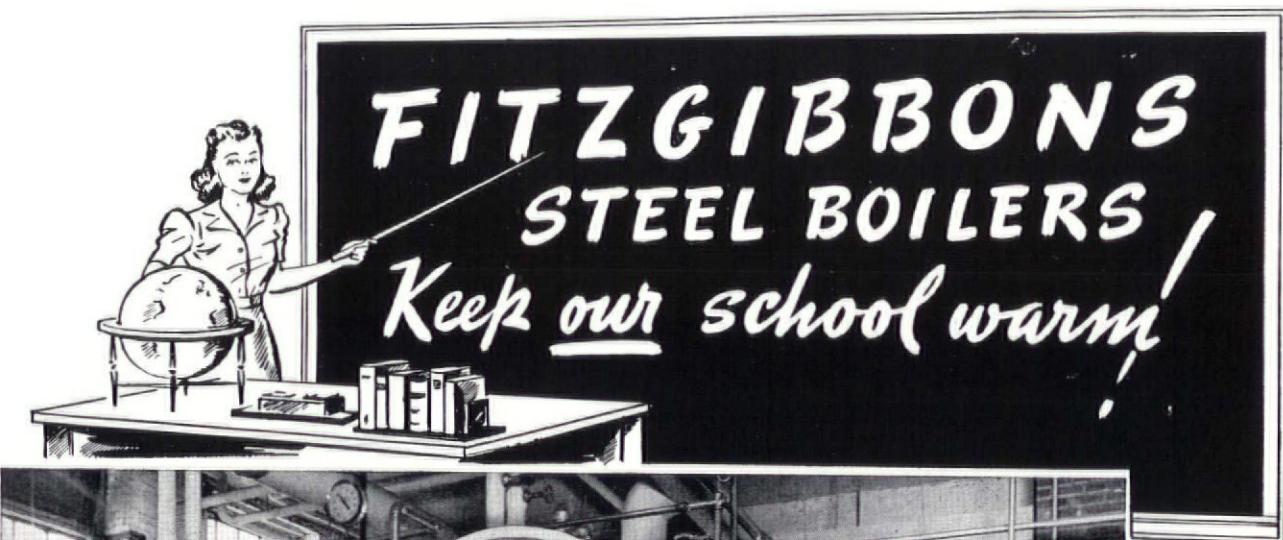
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FOR CREATING BEAUTIFUL INTERIORS

PLAIN-COLORS HORIZONTALINE WOOD-VENEERS • HEATEX •
TILE-PATTERNS MARBLE-PATTERNS • CARSTENITE • MARSH MOULDINGS



ONLY ONE FIRING PER DAY at the McKinley School

Kearny, N. J.—but that keeps 22 school rooms at 70 degrees during school hours, and around 60 degrees the rest of the time. The two sturdy Fitzgibbons R Z U Boilers, with their L. J. Wing Combustion Control,* have proven so efficient that only one boiler at a time was needed during the past winter, even when outdoor temperatures hovered around zero. Low-cost rice anthracite is the fuel, and operating savings since installation a year ago already run into important figures, while the school enjoys an abundance and uniformity of heat that contrasts gratifyingly with the experience of other years.

Just one more of the many installations which prove that the architect or engineer who specifies Fitzgibbons boilers is taking no chances.

A line from you brings full details on Fitzgibbons boilers, and if you so desire, the full cooperation of Fitzgibbons Service to Architects.

A Lesson in Economy
at the McKinley School, Kearny, New Jersey.

Consulting Engineers, O. Vogelbach & Associates, Newark, N. J., for Board of Education, Kearny, N. J.

Heating Contractor, Thomas H. Branch & Son, 91 Forest Street, Kearny, N. J.



*Combustion Control System supplied by the L. J. Wing Manufacturing Company, Newark, N. J.



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BOOKS

(Continued from page 18)

It is difficult to say what the book has to offer the lay reader. Certainly not what the author intended, for it takes a specially trained eye to find meaning in these photographs of ruined cities, and a very special background to interpret it. It takes a long time, according to Mr. Schmidt, for even the archaeologist to learn to see in these air views the significance of faint lines, shadows, and changes in texture. Nevertheless there is something, even for the reader who can't tell the difference between an artifact and an artichoke. Others will

pass on the significance of the Schmidts' explorations, on the importance of dead cities mapped but as yet uncovered. There still remain the magnificent photographs, whose strangely beautiful patterns seem even more strange because they show a land few Western people know anything about. The names revive memories of history and legend: Pasargadae, tomb of Cyrus the Great, rifled by soldiers of the even greater Alexander; the Great Wall of Iran, stretching for 170 kilometers as a barrier against restless hordes from the North; Isfahan, whose square and mosque are still among the most beautiful things created by man; Girdkuh, fortress of the Assassins, whose sinister background forms the most appropriate of settings for a murderous sect. In the text there is

packed a great deal of information, some of it about the places photographed, much about the technique of aerial exploration. The book is handsomely designed and large enough so that the pictures can really be seen. If the price is too high, it is still worth a trip to the local library.

BRITAIN AT WAR, Edited by Monroe Wheeler. The Museum of Modern Art, New York. 97 pp., illustrated. $7\frac{3}{4} \times 10\frac{1}{4}$. \$1.25.

This is the catalogue of the current exhibition at the Museum of Modern Art in New York, which shows the impact of the war on English painters, poster designers, cartoonists, and photographers. Topping the list in interest and significance are the photographs. Whether it is because only the camera can satisfy the desire for a completely straightforward and realistic picture of what is actually going on, or because the men behind the cameras are better craftsmen than the painters is hard to say. The fact remains that a cleverly composed abstraction of a burning tenement house, far from expressing the horror in the scene, merely gives rise to the



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Improved Wing Test, by Keith Henderson

irritating suspicion that the modern painter is a sterile and apathetic creature who records a dish of apples or an explosion with about the same emotional intensity. The same, incidentally, goes for the academicians, who have merely set up their easels in front of new types of subjects. In posters and cartoons, both fields in which the English have done very well, there is some excellent work, and the section on camouflage is brief but well done. There are a number of short articles by representative English writers.

DECORATIVE ART 1941, Edited by C. G. Holme. The Studio Publications, Inc. 128 pp., illustrated. $9\frac{1}{2} \times 11\frac{1}{2}$. Paper, \$3.50. Cloth, \$4.50.

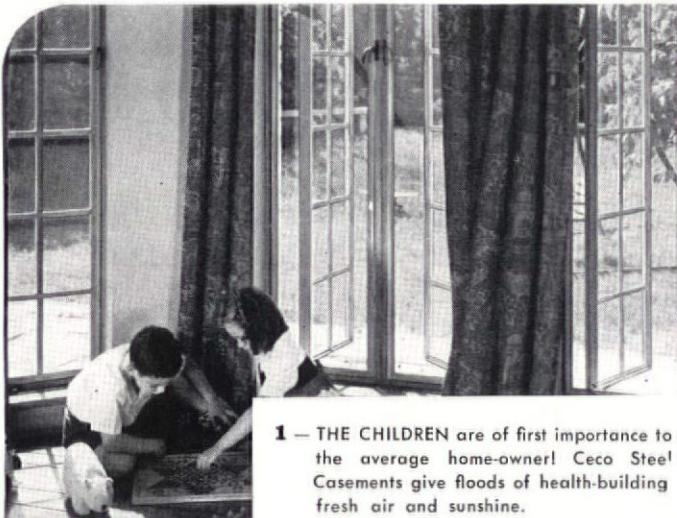
Despite the war, the Studio Yearbook goes on substantially unchanged, still one of the most interesting compendiums of interior design to be found. There is little evidence of the war save for an occasional illustration of a shelter and an article on architecture and the war by the eminent Professor Reilly, who offers the pious hope that German bombs may be instrumental in effecting the replanning of London that his generation was unable to bring about in a more rational and less expensive

(Continued on page 64)

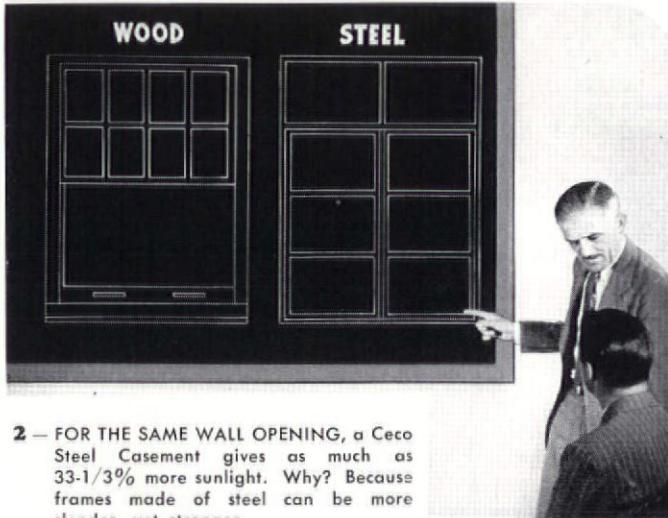


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THIRD of a series of advertisements on How To Design and Build Homes That Sell!



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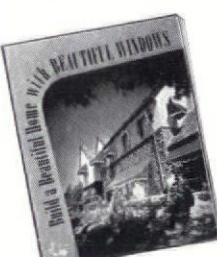
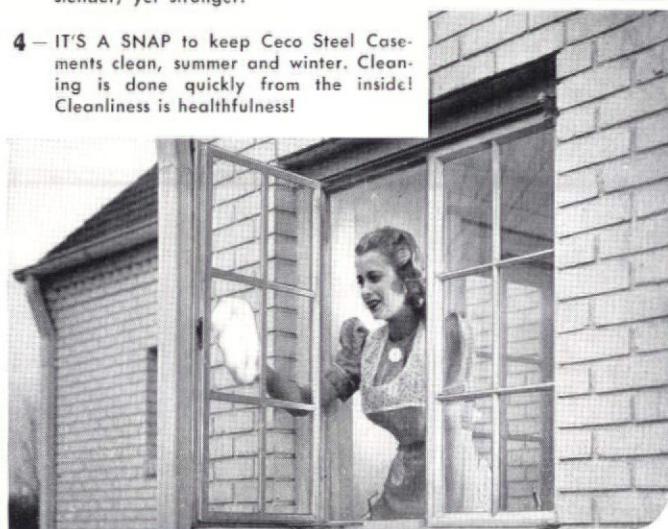


2 — FOR THE SAME WALL OPENING, a Ceco Steel Casement gives as much as 33-1/3% more sunlight. Why? Because frames made of steel can be more slender, yet stronger.



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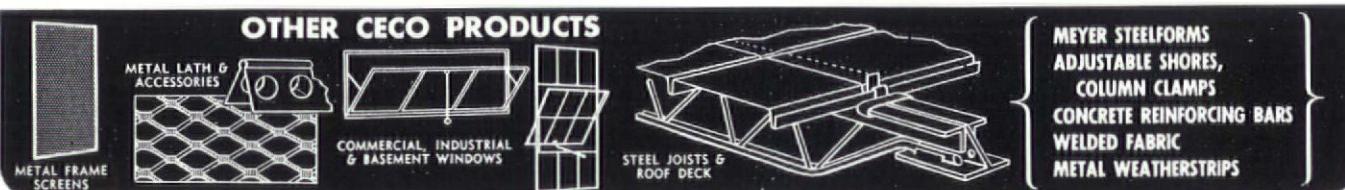
• Health protection—a spic and span house! These are big things with Mrs. Modern Homemaker! Plenty of fresh air and sunshine is just what the doctor and modern health experts ordered! There's a lot of satisfaction—and profit—in giving the people who buy your homes Ceco windows that truly fit modern living demands. Get the Ceco Steel Casement story now!

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Triple shifts for defense mean triple duty for defense plant equipment.

Even under "all-out" service conditions, Whale-Bone-Ite Closet Seats will stop replacement costs and still be serviceable a long time after. They have no finish coat to wear off; they're molded of "diamond-hard" composition with a resilient laminated core. They're water-tight, warp-free, easy-to-clean, and have molded-in hinges that don't loosen or corrode. Repeated disinfecting doesn't harm their lustrous jet black surface.

What's more, Whale-Bone-Ite Seats cost no more than ordinary heavy-duty types.

THE BRUNSWICK-BALKE-COLLENDER CO.
625 South Wabash Avenue, Chicago, Illinois
MAKERS OF FINE CLOSET SEATS FOR EVERY INSTALLATION

Brunswick
WHALE-BONE-ITE CLOSET SEATS



Many architects, builders and maintenance men

have found a simple way to end painting worries. Their paint specification for all properties is the same—Eagle White Lead mixed with linseed oil.

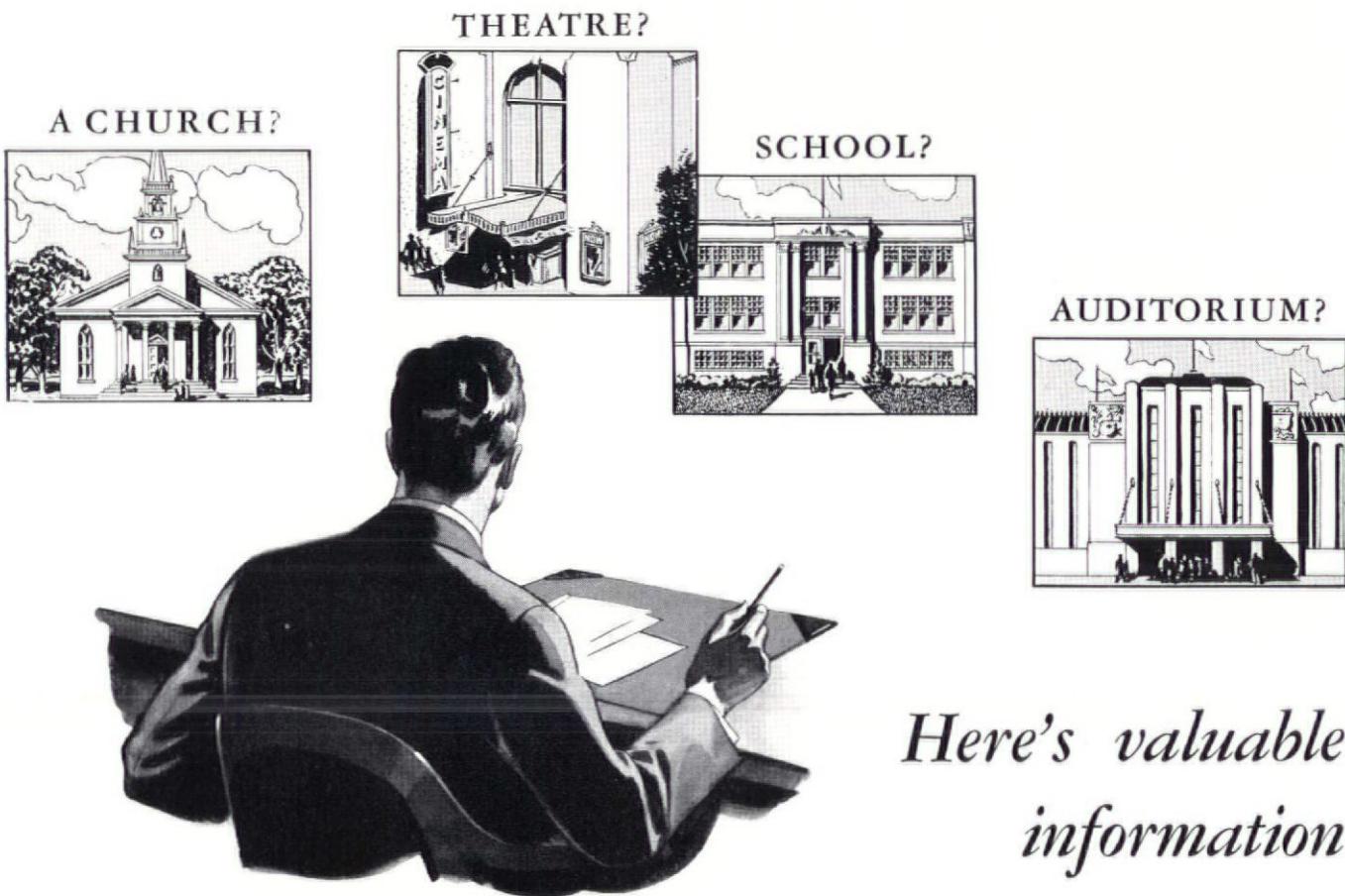
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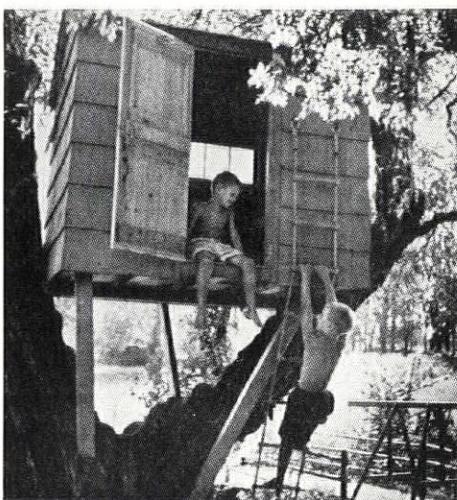
(Continued from page 60)

fashion. As a guide to post-war architecture he submits the work of Oliver Hill, who is probably the most pretentious and superficial designer in the entire modern English group. There seems to be more American work in this volume than in its predecessors, and considerably less, with good reason, from the Continent. By and large, the material illustrated is up to the standards previously established by the editor.

DESIGNS FOR OUTDOOR LIVING, by Margaret O. Goldsmith. George W. Stewart, New York. 358 pp., illustrated with photographs and plans. 7½ x 10¼. \$3.75.

Margaret Goldsmith is an interior designer and amateur gardener who has taken about half a busman's holiday in writing this book. Unlike so many of the books which claim to inform the layman, this is a serious and well documented piece of work which presents valuable information in workable form. The author also sticks closely to her subject, and has refused to be hampered by style prejudices. Playhouses with thatched roofs and glass-walled rooms are presented with equal interest, emphasis always being intelligently concentrated on the ideas involved.

There are twelve chapters, in which literally every aspect of outdoor living is discussed. Two chapters deal with enclosed courts, porches and terraces. A third takes up the problem of the entrance, which has been so completely changed by the universal use of the motor car. There are other sections on the small backyard, play



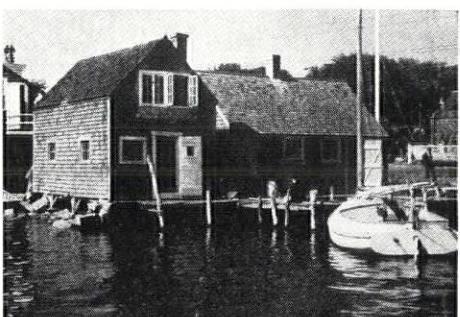
Tree House, Westport, Conn.

areas for children and adults, swimming and wading pools and structures which serve them, outdoor dining areas, and the utilization of natural features. Two appendices give plant lists for special purposes and sizes of game areas.

The method of presentation is largely in the form of case histories. Photographs and plans of an example are shown and are described in detail, with the result that the reader can really follow a job through, knowing exactly what was done and why.

MARThA'S VINEYARD, by Samuel Chamberlain. Hastings House, New York. 73 pages of photographs. 6½ x 7½. \$1.25.

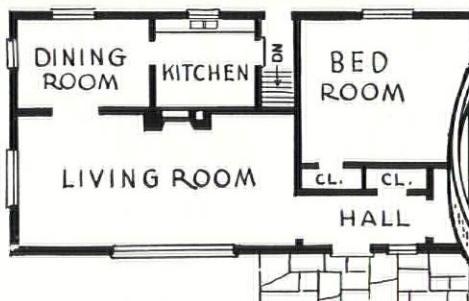
Mr. Chamberlain's output of first-rate photographs of the New England scene



continues undiminished, with nearly a dozen of these attractive little books now off the press. Martha's Vineyard, like the old Massachusetts coast towns, is enormously photogenic, and it has the same combination of fine architecture and beautiful seascapes. Mr. Chamberlain and his camera have made the most of both.

As a service to interested readers THE ARCHITECTURAL FORUM will undertake to order copies of books not conveniently obtainable locally, which have been reviewed in this department.

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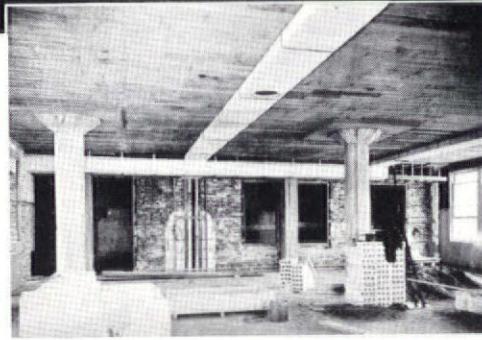
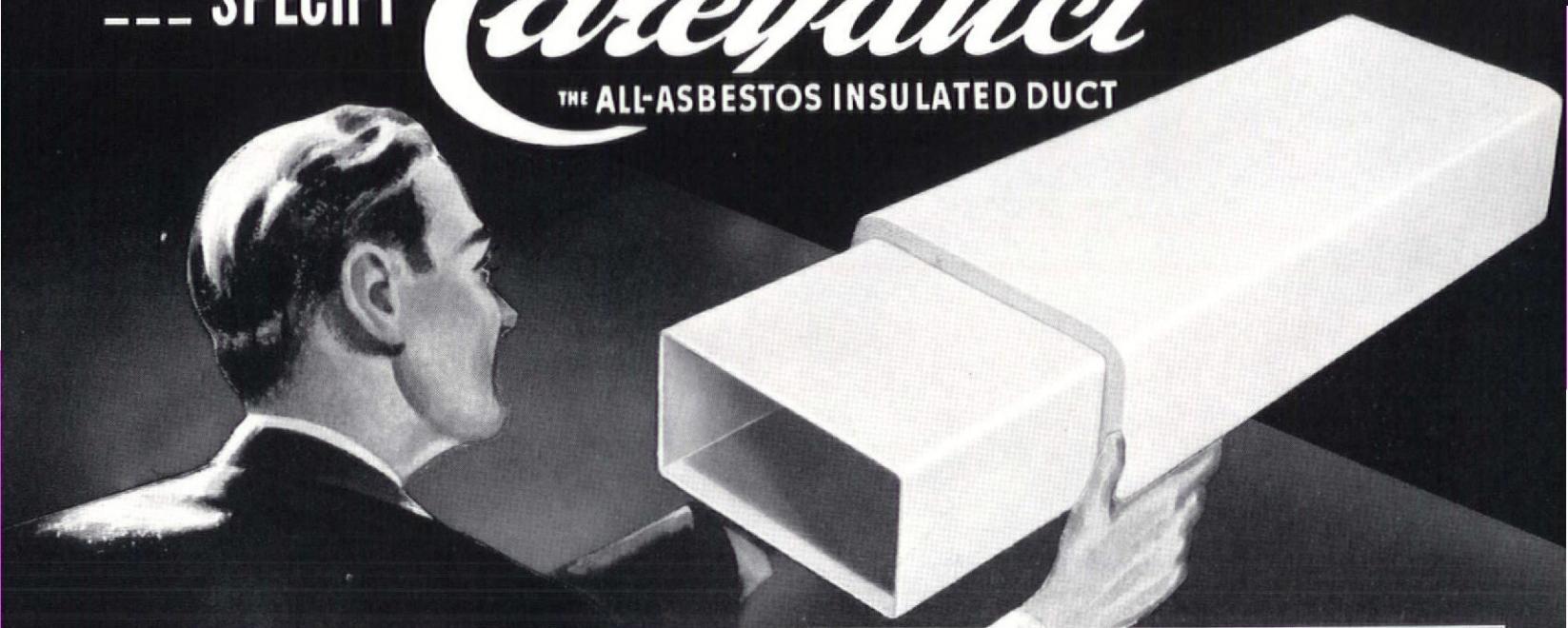
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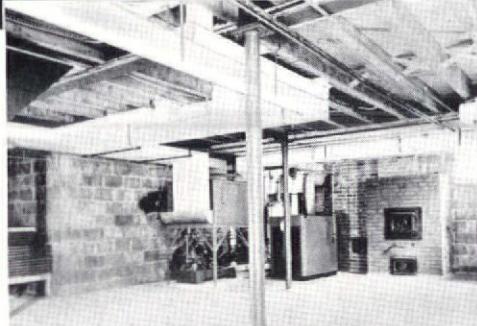
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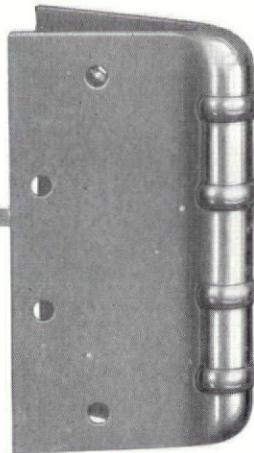
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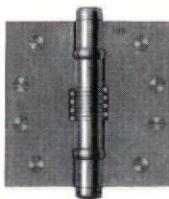


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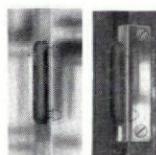
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Architects in all sections of the country are specifying Dunham Sub-atmospheric Steam Heating because it holds fuel costs to the minimum; provides control in an accurate automatic manner; and minimizes replacement costs to a negligible matter even after years of service.

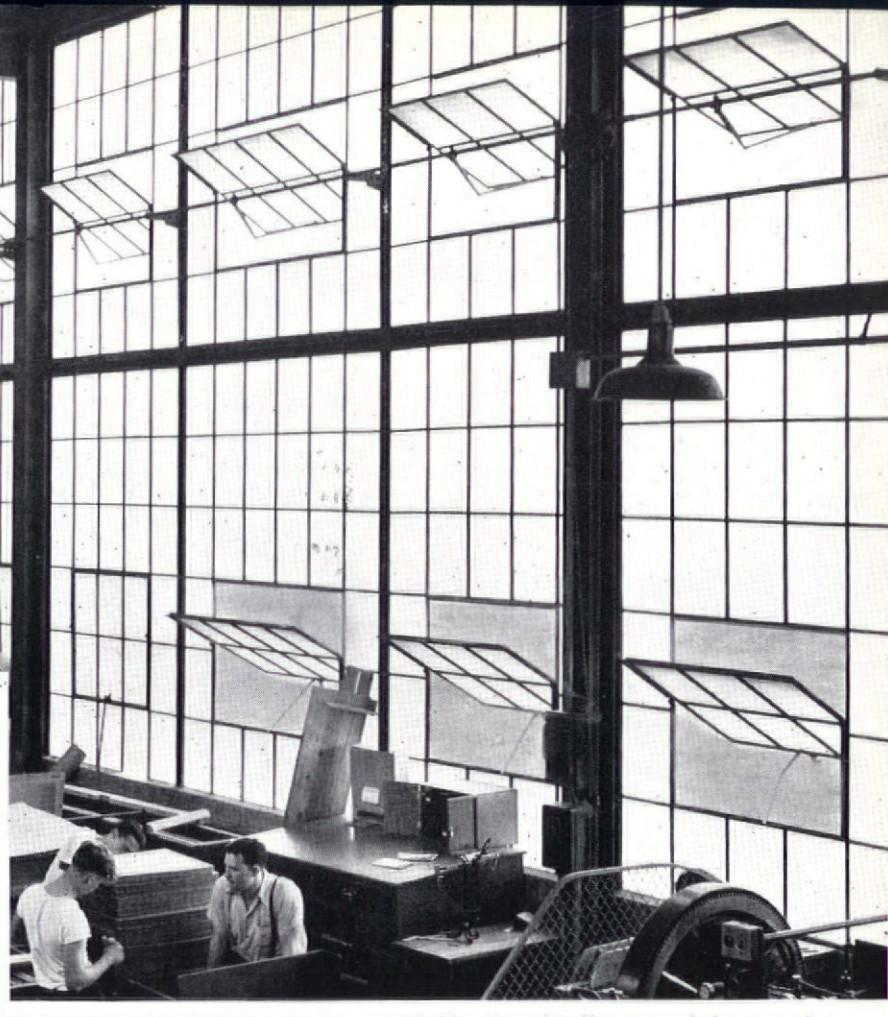
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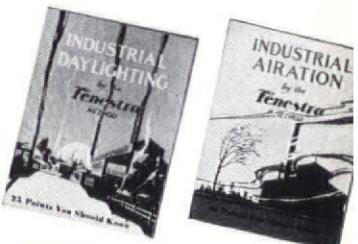
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LETTERS

(Continued from page 22)

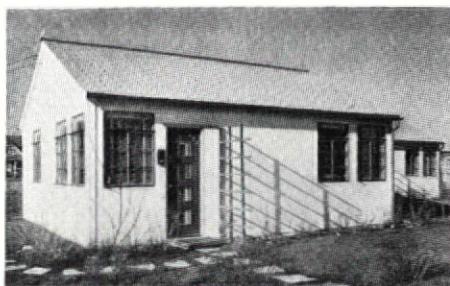
side walls and the height of the rooms (the roof is the ceiling), but these huts are well and tightly built, and Mrs. Rice says they are very comfortable in winter.

P. H. TROUT

Roanoke, Va.

Forum:

Fuller's prefab is the first to achieve a unity between system of construction and design. As a prefabricator and architect, I think I am reasonably qualified to express an opinion. Our own little plywood cheese boxes have never been able to achieve this



GOLDBERG CHEESEBOX

quality, with the FHA, PBA, and Public over our heads. Congratulations, but:

What do you do about condensation, Mr. Fuller and associates? Our own houses are so tight, the flushing of a toilet on a cold day produces ice on the windows.

About costs, no crap. This metal job of

Fuller's is \$3.53 per sq. ft. FORUM, January, 1940, carried a story of our houses at \$3.84 per sq. ft. including, however, a heating system, connection to utilities, wardrobes, attic storage, and kitchen cabinets, and we don't think it is especially wonderful to be able to offer to all comers a single room and full bathroom, 17 x 21 ft., completely erected in the U.S., with attic storage and 84 sq. ft. of window area for the price of \$1,100 in lots of five or more...

But why disguise the reduction of standard of living below a minimum as an economical product of the machine. Mr. Fuller's house is neither economical nor livable, despite the emergency, and I think his greatest job of proving is not that he can build such a house but that people can be trained to live in them.

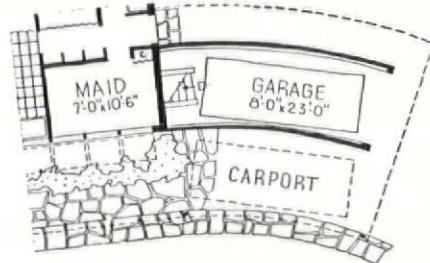
Again, the design job was a thrill to me, but if you are going to use the machine for housing, Mr. Fuller, please produce a higher standard with it at a lower price than the rest of us using the machine are working with. We like your bathrooms.

BERTRAND GOLDBERG

Chicago, Ill.

Forum:

Following is a copy of an open letter to Mr. Walter F. Bogner whose house appeared in the January issue of your magazine:



Dear Mr. Bogner:

Having been startled by your new house, as shown in the January issue of ARCHITECTURAL FORUM and having had several months to digest it, we now write to ask how your family, your friends and the Harvard architectural students like it.

The garage: which wore through first; the side of your car or the wall?

And the great stone wall for privacy! Does it act as a more effective shield than some lighter, less oppressive material?

Seriously, though, being modernists ourselves, we think the house has a commendable freshness of feeling and would like to ask how you arrived at a curved garage. Is it because your wife couldn't back the car out straight?

R. A. MCCLURE
ARNOLD G. GANGNES
DEAN E. HARDY
FRED F. BASSETTI

Seattle, Wash.

P.S. We, the above-signed Senior students in the School of Architecture, University of Washington, hereby make application to design the curved car to fit your garage.

So young and already so conservative! Tsk, tsk!—Ed.

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ARM CHAIR IN SPECIALLY SELECTED SMALL-GRAIN BLEACHED OAK. SEAT AND BACK STRAPPED IN SADDLE LEATHER. \$54
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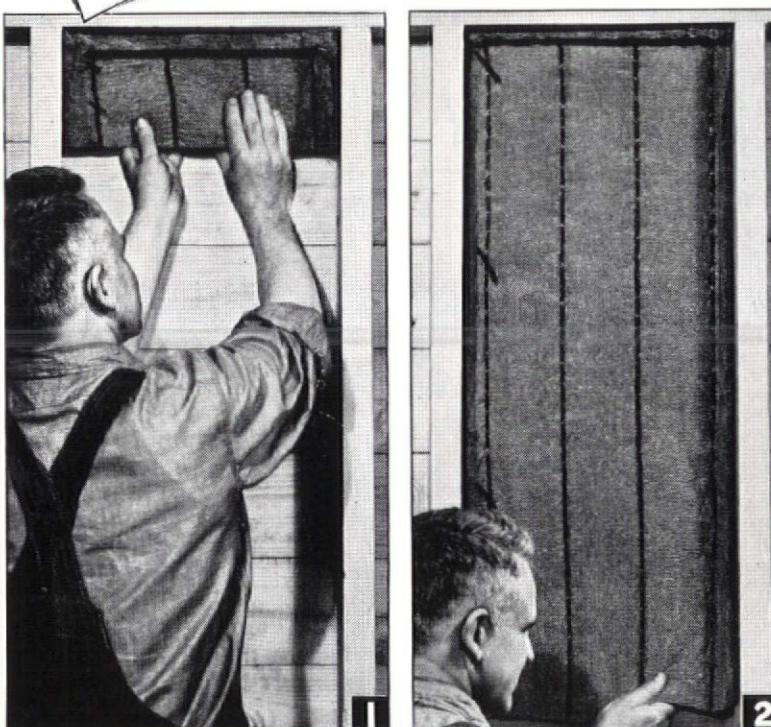
(Continued on page 72)

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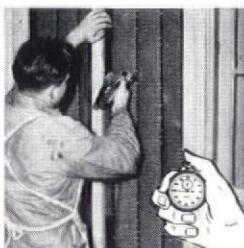
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KIMSUL goes up FAST! It's usually only a one-man job to install KIMSUL. Workmen like to work with clean, odorless, non-disintegrating KIMSUL.

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How to Protect a Project

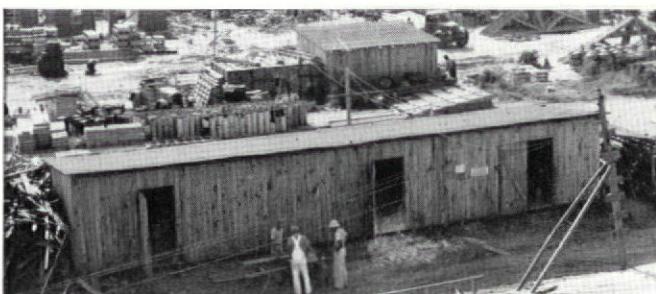


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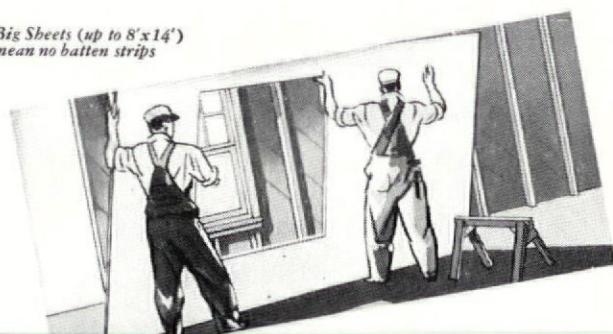


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↖ Sand Finish exterior wall needs no refinishing for 25 years

Dry-wall construction—perfected through the use of Homasote in large, crackproof sheets—is here to stay. That is proved by \$6,000,000 of architect-designed Precision-Built Homes already constructed by this up-to-the-minute building method.

Dry-wall construction allows the architect complete freedom of design. The home can be of any size...any type. Permanently crackproof Homasote, in sheets up to 8' x 14', eliminates unsightly batten strips and wall joints...forms a perfect *interior finish*, an ideal base for paper or paint. There is no waiting for plaster to dry...no danger of falling plaster.

Homasote, as exterior sheathing,

is an excellent base for any veneer—from fieldstone to clapboard. It is used with complete satisfaction for *exterior walls*—treated with Homasote Sand Finish, giving a stucco texture forever free from cracking and blooming.

In all three uses, Homasote is glued, as well as nailed, to the studs for extra strength...tight, sure insulation.

Because Homasote dry-wall construction provides a quieter, stronger, thoroughly insulated building—heating and maintenance costs are lower...only the smallest heating plant is required.

We invite you to write today for the full facts about this important new technique in the building industry.

HOMASOTE COMPANY
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Gone with the windows . . .

FEWER and fewer men will experience the thrills, and the dangers, of window washing. They're passing with the growing trend to windowless plants, stores and offices.

For air and light, windows were long necessary, imposing limitations upon you and your clients. Restricted design possibilities in the façade. High ceilings. Space-wasting light wells. Unequal rent values. High costs for heating, maintenance and repairs.

But buildings need not be designed with windows today. In fact, they're better without them! Modern air conditioning for winter and summer, properly designed, supplies clean air at proper temperature and humidity—perfect ventilation without the need for windows that let out expensive heat, let in distracting noise.

And why not have bright daylight all the time? Fluorescent lighting is even better than daylight—because in sunshine or rain, the illumination can

be uniform throughout the building.

Experience with windowless buildings has been extensive enough to show several important advantages in addition to new freedom in design.

Consider the heat wasted by windows. In windowless buildings, *the reduction in heating costs in the winter offsets the additional cost in summer months of both air conditioning and lighting!*

Without windows, "E," "L" or well-type construction for large buildings is eliminated. This brings down the cost per cubic foot, increases and helps equalize rental values. Air conditioning, fluorescent lighting and proper use of color have outmoded high ceilings, permit more floors, more usable space, for a building of a given height.

These are the main sources of savings and greater values in windowless buildings. Consider them carefully. Present conditions make a detailed evaluation of this modern construction more important than ever before.

Inside facts...

about windowless buildings!

- ★ LOWER COST HEATING, MAINTENANCE AND REPAIRS
- ★ MORE FLOORS FOR THE BUILDING HEIGHT
- ★ GREATER FLEXIBILITY OF LAYOUT
- ★ ELIMINATION OF "E" AND "L" CONSTRUCTIONS

Kinetic Chemicals, Inc., the manufacturers of "Freon"® refrigerants specified by the careful architect because they are safe and efficient.

*"Freon" is Kinetic's registered trade-mark for its fluorine refrigerants.

LETTERS

(Continued from page 68)

POST-WAR PATTERN

FORUM editors present the first of the letters received in reply to the introduction to the Post-War Pattern series. Others will appear in subsequent issues.

Forum:

... We felt that you might well give a little more attention to the building problems which are arising out of the current shifts in population and industry. As you of course know, there is now under way in this country one of the greatest migrations in history, arising partly out of the development of new defense industries and part-

ly from conditions which existed long prior to the war. . . .

I hope that somewhere in your series of articles you will deal with the peculiar problems of rural housing, which presents one of the best fields for post-war construction activities, and also one of the most neglected fields so far as architecture, engineering and financing are concerned.

Needless to say all of us here are looking forward with considerable interest to the forthcoming articles in your series.

C. B. BALDWIN

Administrator of Farm Security
U. S. Dept. of Agriculture
Washington, D. C.

Forum:

... This statement with respect to technological advances is perhaps the most

provocative. Your analogy with industry is, of course, well taken, except that industry has been able to demonstrate that by scrapping machinery in favor of better machinery it can reduce the cost or improve its production. If there were some way by which you could bring that point out, or indicate that a demonstration through better health, lower living cost, or something of that sort would justify scrapping structures normally considered useful after a considerable period of use, your point would be more convincing. I mention this because I am thoroughly in sympathy with your idea, but I am not sure that you have put it over. . . .

... Your statement has punch, life, etc., and I am all for it. More power to you.

E. S. DRAPER

Washington, D. C.

Forum:

... I am in agreement with many of your excellent suggestions but after reading the article find a feeling not of complete understanding but of having just returned from a showing of Fantasia or having been exposed to machine gun fire. . . .

W. H. BALLARD

Boston, Mass.

Forum:

... I wish to especially commend your "Correction" No. 10; the key to the whole problem is *low cost and shorter lived buildings*. I have frequently criticized the USHA for putting up Slum Clearance Projects on a 60 year amortization. Technological advances will make these buildings obsolete within a comparatively short time and they are apt to be slums all over again, long before the 60 years expire. . . .

Your comments on the rehabilitation of blighted areas states the problem as it is generally understood, but here in Texas, we do not admit that population is yet stabilized. There are new frontiers to open and there is no assurance that it will continue to be economically necessary to maintain large populations where they are now located. Industry is on the march! . . . and before rehabilitating the blighted areas of the cities, a detailed study should be made to find out, if possible, just what is going to be the highest and best use for these areas in the future. . . .

J. K. STIRTON

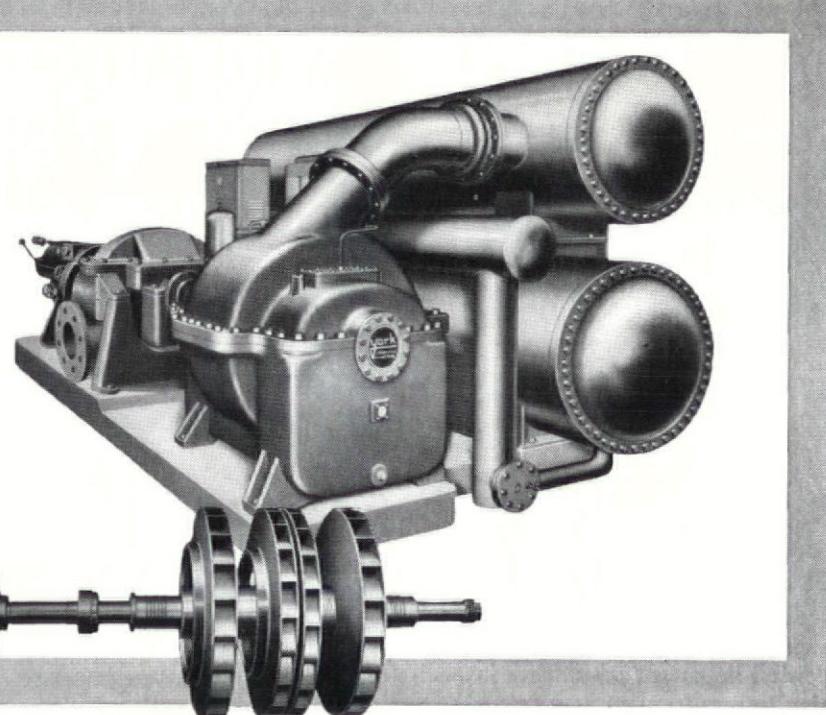
Houston, Texas

Forum:

... One important corrective which seems not to be clearly brought out here is the need for individual buildings to be based upon adequate neighborhood or community plans. Another way to say this is that we must have adequate neighborhood and community plans to serve as the basis of determining the general character, extent and location of individual building projects—these plans to be made, of course, by the responsible planning authorities in each jurisdiction. . . .

H. S. OSBORNE

Chicago, Ill.



Stainless Steel Impellers give York Turbo Compressor LONG-LIVED BALANCE

Design counts in a machine that turns at three to six thousand rpm. Impellers made from stainless steel, and perfectly balanced at the factory, remain that way, year in and year out. . . . and with stainless steel there is permanence.

When you consider this important advantage, remember, too, that in the York Turbo Compressor, the use of balance discs makes

thrust bearings unnecessary. . . . that the York shaft seal may be removed for inspection without removing the refrigerant. In large scale air conditioning, the York Turbo Compressor presents new economy with all the traditional York dependability. York Ice Machinery Corporation, York, Penna.



YORK REFRIGERATION AND AIR CONDITIONING

"Headquarters for Mechanical Cooling Since 1885"

ARCHITECTS FROM COAST TO COAST... GLORIFY BATHROOMS with MIAMI CABINETS AND ACCESSORIES...



Cabinet illustrated is THE DUCHESS

Behind the circular mirror set in a chromium plated frame of brass, is a spacious cabinet. Mirror-lined, recessed shelf above lavatory is No. 900. Towel supply and utility cabinet No. 500, is shown at right.

IT is no matter of chance that MIAMI CABINETS lead the world in popularity and sales . . For MIAMI leadership began in bold, new ideas of design, of construction . . in utility . . of incomparable beauty . . and this leadership has progressively continued.

Build the eye appeal of your bathrooms around a deluxe MIAMI Cabinet. Leading architects find this the soundest of procedure . . for these glamorous creations introduce an effect of vivid beauty and harmony not otherwise attainable.

MIAMI Cabinets and Ensembles are adequate in utility as well as eye appeal, providing extra shelf space for towel storage and other family needs; also space for the supplies of each individual. Whatever the need for any type of home, hotel or institution, there is a MIAMI Cabinet that meets it exactly, in size, cost and completeness. Make your bathrooms adequate — make them gloriously beautiful — specify MIAMI Cabinets. See Catalog in Sweet's, or write for full information, address Dept. AF.



Residence in Peoria, Ill
Architects: Jameson & Harrison, Peoria



Residence in Denver, Colorado
Architect Willard Walker, Chicago



Residence in Governeur, N Y
Architect: D. Kenneth Sargent, Syracuse, N Y.



Residence in Los Angeles, Cal
Architect H. J. Kanauer, Los Angeles

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THE PHILIP CAREY COMPANY
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MERIT-METER proves
MESKER STEEL SASH
gives you at least
35% MORE
QUALITY
for your money!

POINT NUMBER	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
SWORN BASIC FACTS USED AND FROM 1940 SWEET'S CATALOG	Painted Bars 1/2" gauge	Painted Frame Bars 1/2"	Monel Bars 1/2" gauge	All weathering bars 1/2" gauge	Painted Bars 1/2" gauge	Monel Bars 1/2" gauge	Painted Frame Bars 1/2" gauge	Monel Bars 1/2" gauge	Painted Bars 1/2" gauge	Monel Bars 1/2" gauge	Painted Bars 1/2" gauge	Monel Bars 1/2" gauge	Painted Bars 1/2" gauge	Monel Bars 1/2" gauge	Painted Bars 1/2" gauge	Monel Bars 1/2" gauge	Painted Bars 1/2" gauge	Monel Bars 1/2" gauge	Painted Bars 1/2" gauge	
MESKER	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	NO	YES	YES	NO	YES	NO
SASH-A	YES	YES	YES	NO	NO	NO	NO	NO	YES	YES	NO	NO	NO	NO	NO	YES	NO	NO	NO	50%
SASH-B	NO	NO	NO	NO	NO	NO	NO	NO	YES	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	30%
SASH-C	NO	NO	NO	NO	NO	NO	NO	NO	YES	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	25%
SASH-D	NO	NO	NO	NO	NO	NO	NO	NO	YES	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	30%
SASH-E	NO	NO	NO	NO	NO	NO	NO	NO	YES	NO	YES	NO	NO	NO	NO	NO	NO	YES	NO	35%

★ **The MERIT-METER**
Sworn facts taken largely from 1940 edition of Sweet's Architectural Catalog File. A point-by-point comparison of steel window quality features. Very enlightening.

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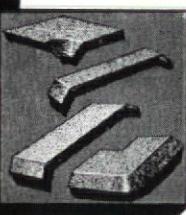
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Send me further information about the YPS line of Cabinet Sinks, and Base and Wall Cabinets.

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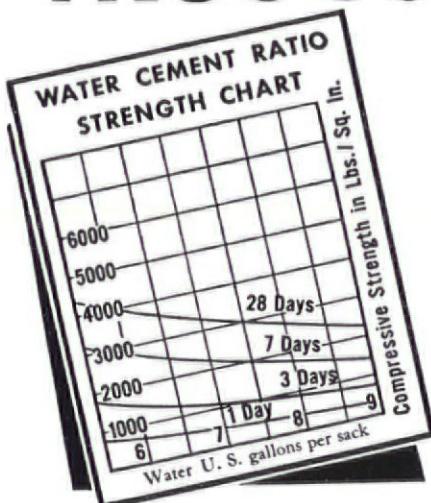
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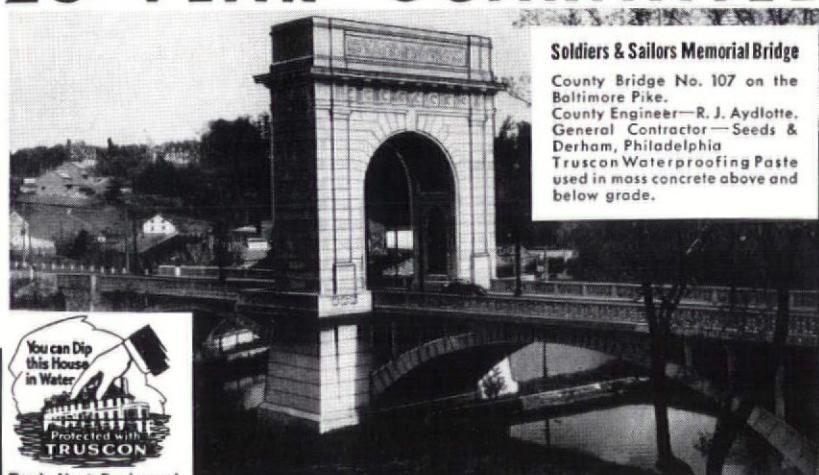
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BATHROOM BEAUTY is a matter not only of design, but of a satisfactory execution of your ideas by the materials you choose. Specify Carrara Glass for bathroom and kitchen walls . . . and you'll be sure the finished job comes up to expectations. Architects: Willing, Sims & Talbutt.

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Architects say it's "Tops" in bathroom wall materials

TIME after time, architects have told us that they prefer Carrara Structural Glass to all other materials when it comes to wall covering for bathrooms. Its versatility, its polished good looks, and its adaptability to various treatments make it the ideal medium for this purpose.

Carrara is available in ten delightful, enduring colors. It can be shaded, fluted, sand-blasted, deep or shallow-etched for decorative purposes. And there's a new Suede-finish Carrara that makes possible many striking effects.

Carrara won't fade, check, craze, or stain. It is impervious to moisture and chemicals. It is easily cleaned. Because every piece is mechanically

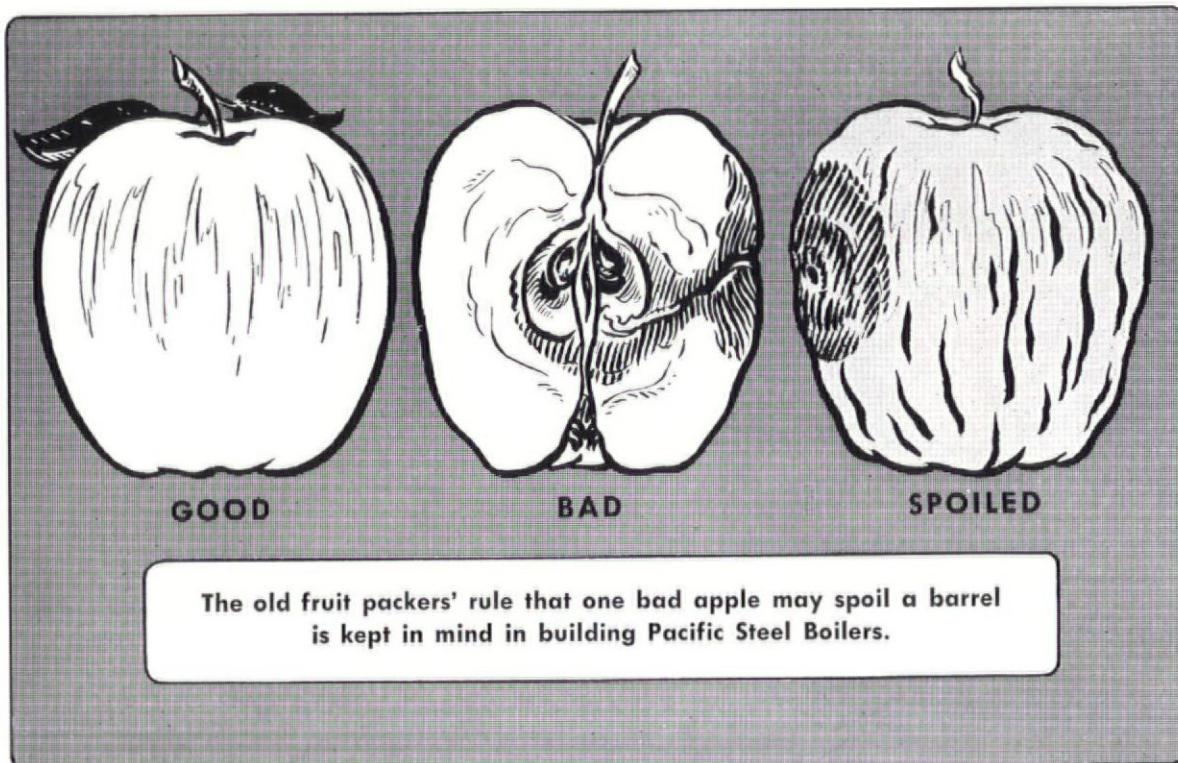
ground and polished, it has a reflective beauty achieved only in a glass that's precision-made. Carrara walls, ceilings, shelves and sill covers have no lippage at the joints, never warp.

Write us, today, for detailed information about Carrara Glass and its use in bathrooms and kitchens. Address Pittsburgh Plate Glass Co., 2139-1 Grant Bldg., Pittsburgh, Pa.

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The modern Structural Glass
PITTSBURGH • PLATE GLASS COMPANY

How One Bad Apple Tells a Story for Pacific



AS A worm hidden in the heart of one apple may spoil an entire barrel of apples, one hidden flaw in a boiler can threaten the entire boiler. In recognition of this fact, every detail of Pacific steel heating boilers is planned, built and inspected to secure long life and low maintenance costs.

From the minute a Pacific boiler is put into production until it is completed, the various plates and parts are inspected by an authorized boiler insurance inspector—a necessary safeguard against costly boiler shutdowns just when heat is needed most.

Finally, each completed Pacific boiler is double

tested. First the firebox and shell are tested as separate units—then the two units are assembled and given a second test.

Too—take the question of cleaning as an example. Pacifics are designed and built to make every part of the boiler, inside and out, readily accessible for cleaning. So, with a small amount of effort, years of life can be added to Pacific boilers and unnecessary repair bills saved.

Thoroughly inspected—double tested—easily cleaned—three reasons among many in favor of your using Pacific boilers.

Write for a complete file of Pacific boiler catalogs.



PACIFIC

STEEL HEATING BOILERS

DIVISION OF UNITED STATES RADIATOR CORPORATION, DETROIT, MICH.

This is BIG

Libbey-Owens-Ford Broadens National Campaign to Include ALL PRICE CLASSES; Glass Designed for Happiness Theme now to Work for Architects in all Fields



ANNOUNCEMENT that the Libbey-Owens-Ford Glass Designed for Happiness program is being broadened nationally to include homes in *all price classes* is of especial interest to architects. Not only does this program, developed to stimulate the wider use of glass in residences, lend itself directly to the design problems of the architect, but it coincides with the plan of government agencies to provide better housing conditions for the nation.

American architects particularly appreciate the importance of the wider use of glass. They know that its use in windows, for example, lets in more useful outdoor light . . . brightens up the interior . . . and helps to reduce illuminating costs. The use of Window Conditioning is another example of architectural planning which can effect fuel savings as high as 30 percent for the homeowner—a saving with an enormous potential effect on the conservation of national resources. Other inexpensive glass features in residential construction provide proportional convenience and

comfort . . . correspondingly increase property values.

TESTS PROVE THAT GLASS SELLS HOUSES. More than a year of testing in lower price fields has proved the soundness of the Glass Designed for Happiness program . . . has repeatedly emphasized public acceptance of homes making a wider use of glass. From coast to coast, these smaller homes have been snapped up by eager buyers—men and women who wanted these Glass Features and were unwilling to wait until the homes were completed.

NEW SELLING DRIVE OPENS! Now Libbey-Owens-Ford extends the scope of this successful program . . . Puts it to work in all price classes where the architect can have the same sure, favorable response from his clients. And, equally important, this new, broadened program makes it easier for both the architect and the homeowner to get the kind of glass features that add so much utility, beauty and value to the private home.

ARCHITECT'S CLIENTS ARE GLASS CONSCIOUS! For many years it was up to the architect to suggest the use of glass. Today, the architect's clients are more receptive to his suggestions and plans. The public's eager reception of Glass Designed for Happiness in the lower price fields is only an indication of what is to come in all fields of home construction.

PLAN IS PRACTICAL FOR ARCHITECTS! The broadened scope of the Design for Happiness program is essentially helpful to and practical for the architect. Standard glass items are available in price ranges to suit every home. Most of these items can be purchased through any recognized finance plan. Even more important, Libbey-Owens-Ford now makes a broadened source of supply open to the architect and builder . . . with glass and lumber dealers ready to provide the glass features needed by the architect and builder. Where service counts, you will appreciate the convenience of these sources of supply. Libbey-Owens-Ford Glass Company, Dept. AF-741, Nicholas Bldg., Toledo, O.

L O F E

GLASS



AUTHORITATIVE MODERN DESIGNS SOON READY FOR YOUR CLIENTS

To help you take advantage of the public's reaction to this program we will soon make available a series of authoritative modern designs—created by registered architects—especially assembled for this activity. Some you may want to submit to clients as we have presented them, while any one or all may be altered to meet special desires or conditions. These up-to-the-minute Glass Features Designed for Happiness will be provided to architects in a full color brochure.

Designed for Happiness

NEWS!



MODERN PICTURE WINDOWS, designed by architects, will be promoted to the public through national advertising on Glass Designed for

Happiness features. Your clients will be asking you to design similar windows to frame living pictures in their homes.

HERE'S WHAT THEY SAY ABOUT THIS NEW GLASS PROMOTION!

The ARCHITECT:



"Homes can be made brighter, cheerier and more livable with glass. And now that Libbey-Owens-Ford has led the way in promoting glass features for homes in all price classes, our profession will find a much wider demand for, and a greater appreciation of, glass features among our clients. Making glass and lumber dealers community headquarters also gives us an adequate, on-the-spot source of supply and installation."

The DEALER:



"It gives me new and profitable items to sell the year 'round. Helps sell almost every other material I handle. It gives me an opportunity to work closer with, and to co-operate more fully with, both the architects and contractors in my territory."

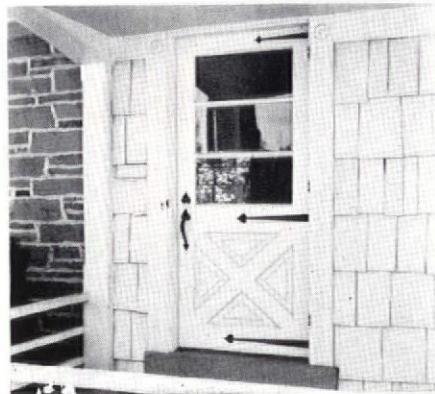
The CONTRACTOR:



"It sounds almost unbelievable, I know, but practically every home in which I've included glass features Designed for Happiness has been sold before it was completed. Surprising, too, how fast built-in glass features can be installed with Libbey-Owens-Ford special methods."



WOMEN LIKE the typical Powder Room designs suggested in this campaign. And, with mirrors of polished L·O·F plate glass, you can create many original arrangements.



MORE LIGHT INSIDE is the function of this entrance way, with extra glass areas creating an attractive exterior.



SO UNUSUAL! Illustrated in L·O·F advertising will be occasional suggestions of glass such as this serving bar and window arrangement of fluted glass, paving the way for your new and different glass designs.



LITTLE THINGS COUNT. Our promotion will suggest the use of mirrors in handy, helpful locations, such as this Kitchen Primping Mirror—another step in creating a greater appreciation of the plans you make for your clients.





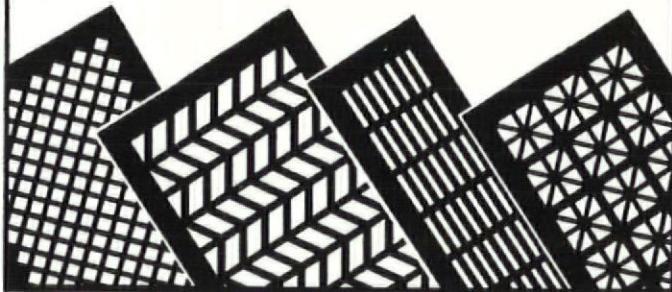
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To understand why New Londoner Hollow - Core Flush Doors are maintaining remarkable performance records everywhere, you only need to know how these famous doors are built. There is a definite reason back of every feature, based on years of experience, experiment and

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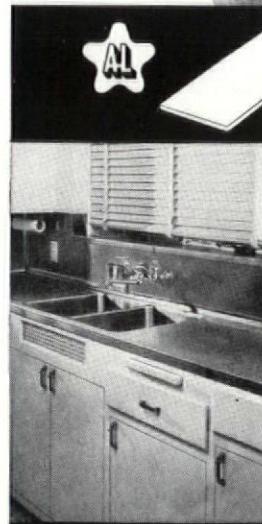
To give you a clearer picture of the part of the door you never see, we are opening a section for inspection and showing you the how-and-why of the method used in building the "climatized" New Londoner Hollow-Core Flush Door.

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For any particular situation there usually is one certain type of roof ventilator which will serve best. Put your problem up to Burt Engineers. Let them advise with you and you will reach the correct solution. Burt makes a type and a size for every industrial, commercial and residential requirement scientifically designed, quality made and priced to give "more air per dollar."

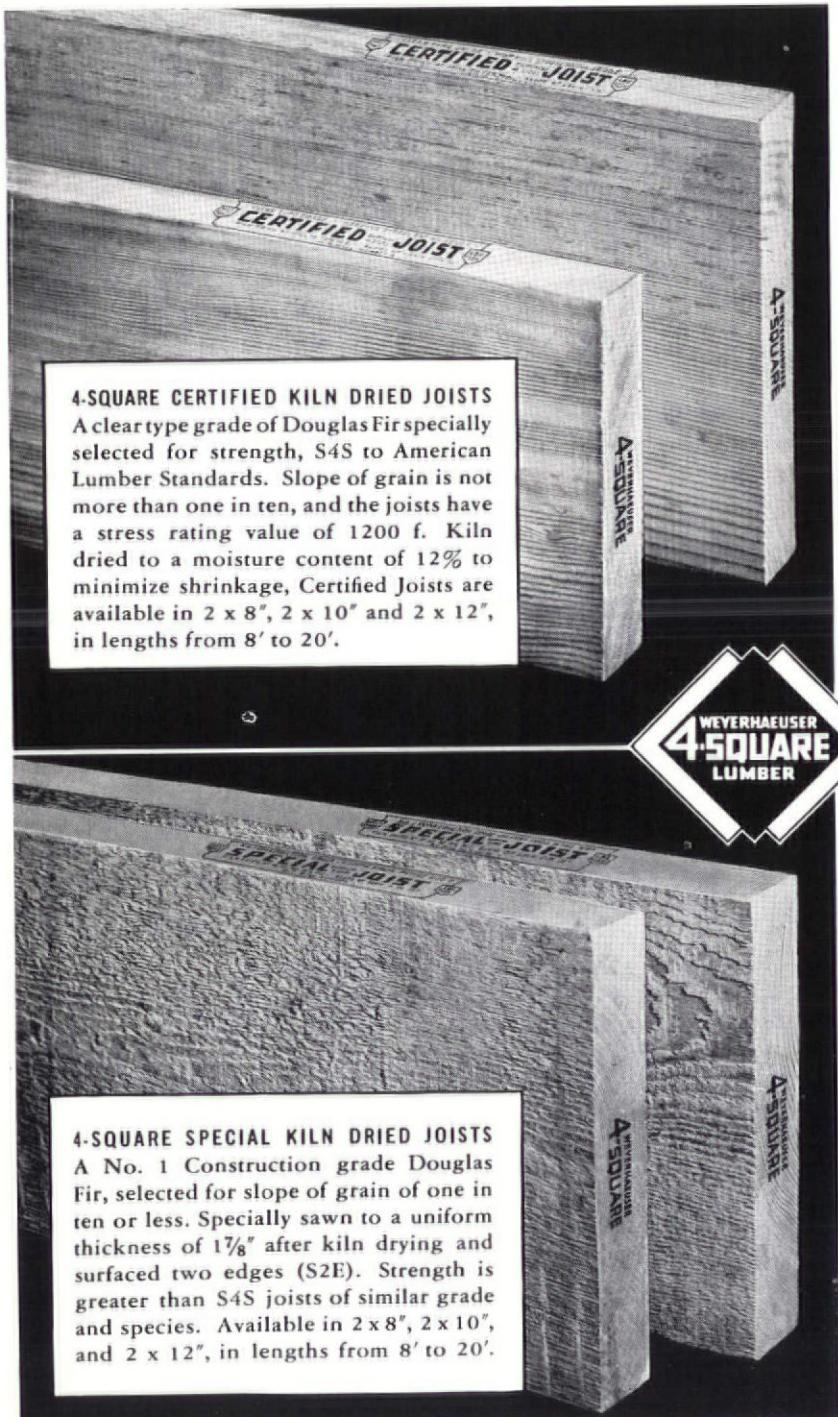
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4-SQUARE CERTIFIED KILN DRIED JOISTS
A clear type grade of Douglas Fir specially selected for strength, S4S to American Lumber Standards. Slope of grain is not more than one in ten, and the joists have a stress rating value of 1200 f. Kiln dried to a moisture content of 12% to minimize shrinkage. Certified Joists are available in 2 x 8", 2 x 10" and 2 x 12", in lengths from 8' to 20'.

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A No. 1 Construction grade Douglas Fir, selected for slope of grain of one in ten or less. Specially sawn to a uniform thickness of $1\frac{1}{8}$ " after kiln drying and surfaced two edges (S2E). Strength is greater than S4S joists of similar grade and species. Available in 2 x 8", 2 x 10", and 2 x 12", in lengths from 8' to 20'.

The Weyerhaeuser mills are making available in Douglas Fir a wide selection of wood joists and framing items which meet many variations in building requirements. This broad choice of improved materials enables the architect to employ wood with even greater satisfaction than ever before.

The native attributes of economy and adaptability of wood are amplified in the 4-Square line of improved framing lumber. With these materials serving an ever increasing number of applications, the architect finds his task of coordinating the factors of cost, design and structural soundness greatly simplified.

4-SQUARE CERTIFIED KILN DRIED JOISTS—In residential construction, 4-Square Certified Kiln Dried Joists are unsurpassed where fine appearance, minimum shrinkage and great strength are important considerations.

4-SQUARE SPECIAL KILN DRIED JOISTS—In commercial structures where strength is a great factor, 4-Square Special Kiln Dried Joists, surfaced only on two edges, provide extra thickness for greater loads.

4-SQUARE CLEAR TYPE JOISTS have been developed for use in construction where the joists must be exposed and good appearance is the primary consideration.

4-SQUARE GUIDE LINE FRAMING—A unique feature is the calibration in feet and inches on each piece. This is a time and labor saver and promotes accuracy on the job. Only No. 1 Construction Grade Douglas Fir is included in this line.

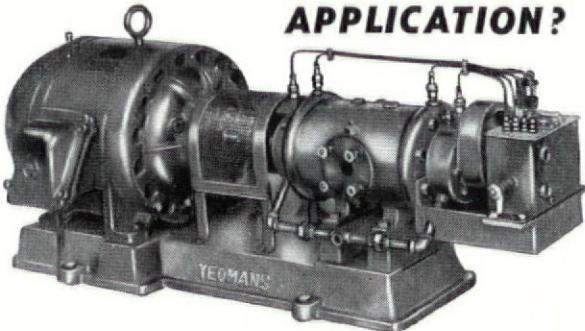
4-SQUARE STANDARD DIMENSION—This line of high grade dimension lumber is produced in Douglas Fir, the premier soft wood species for framing. It is cut to exact standard lengths with smooth, square ends and surfaces. Available in No. 1 and 2 Construction grades with the 2 x 4" size also available in the same grades of West Coast Hemlock.

4-SQUARE ALL HEART DIMENSION—All heart dimension lumber is available for use where the framing members are exposed to conditions which contribute to excessive decay.

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It is winning its way into user's hands the country over—because it's GOOD! Know about it!

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Above is the Yeomans Rotary Compressor or Dry Vacuum Pump—up to 500 C.F.M., pressures to 50 lbs., dry vacuum pumps to 27 in.: handles air and many gases. For use in chemicals, food and power, and as integral units on production equipment.

IF YOU USE A COMPRESSOR OR DRY VACUUM PUMP, YOU OWE IT TO YOURSELF TO KNOW ABOUT THIS ONE. Ask for informative bulletin 7201 — NOW, while you are thinking about it.

GET COMPREHENSIVE BULLETIN!

YEOMANS BROTHERS COMPANY

1424 No. Dayton Street

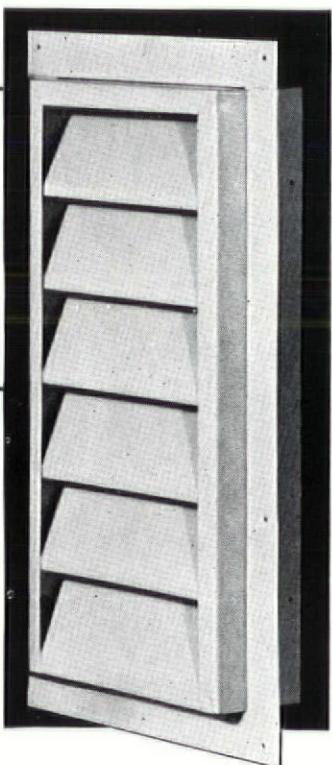
Chicago



Steel attic ventilators COST LESS

IN THESE STANDARD SIZES

No.	Width	Height	Free Area in Sq. In.
811	8-1/8"	11-1/8"	23
816	8-1/8"	16-1/4"	42
824	8-1/8"	24"	70
1214	12-5/8"	13-11/16"	56
1219	12-5/8"	18-13/16"	84
1224	12-5/8"	24"	115
1230	12-5/8"	30"	144
1824	18-1/8"	24"	148
1830	18-1/8"	30"	190
1836	18-1/8"	35-3/4"	234
28 15 HC	28-1/8"	15-1/4"	116
14 15 QC	14-1/8"	15-1/4"	56



Save money on your attic ventilators—specify standard sizes of Donley Steel Louver Ventilators. These stock sizes are low-cost items—they reduce building costs and decrease construction time.

Donley Attic Ventilators are easy to install. In wood, flashing flange is nailed to sheathing with siding against ventilator body. In masonry, brick is laid against ventilator body in front of flange, the face recessed three inches. No wood trim is used.

Get all the facts about these cost-cutting, dollar-saving Donley Steel Ventilators, one of 50 home betterments described in 44-page catalog—sent on request.

The DONLEY BROTHERS Co.

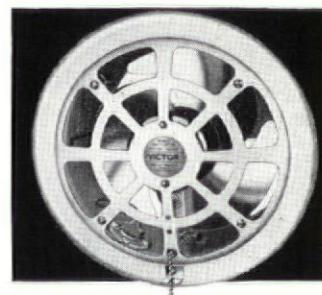
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It wouldn't make sense to build a home without windows. Nor is it wise or modern to design a kitchen without a Victor In-Bilt Ventilator.



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brings natural air control within reach of every home. The perfect Ventilator for the modern home.

VICTOR In-Bilt VENTILATORS



INSULATED PIPE UNITS

Completely engineered for modern requirements on underground distribution of steam, hot water, and oil

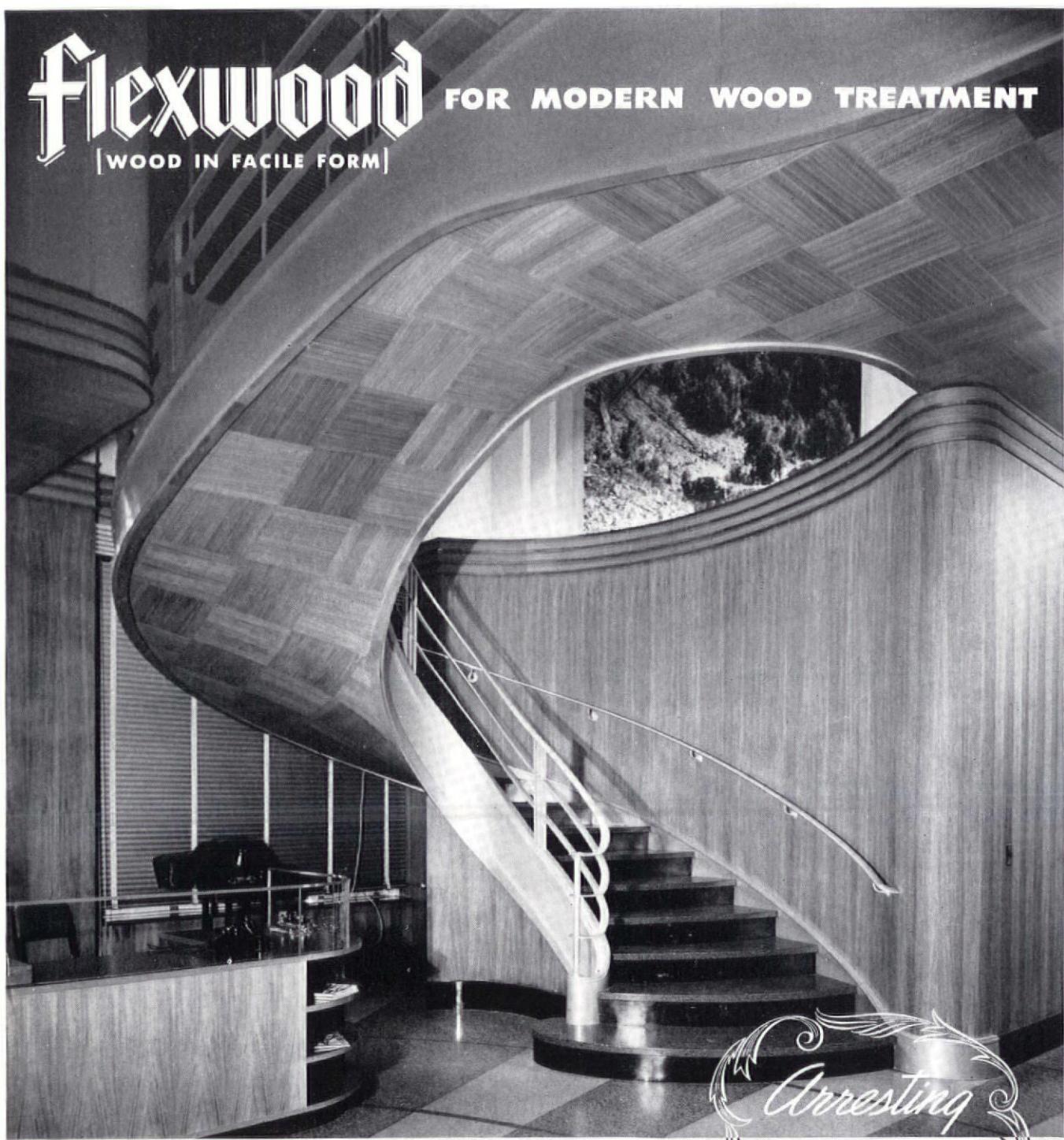
- High thermal efficiency, long life, low installation cost
- Each unit factory pre-fabricated and shipped complete as shown, in 20 ft. units or as required • Prompt shipment —speedy installation—nothing else to buy • Ask your heating contractor, and on your next job, you'll specify it!

BULLETIN ON REQUEST



THE RIC-WIL COMPANY
CLEVELAND, OHIO

Agents in Principal Cities



E. L. Fisher
Walnut Flexwood treatment, lobby, Coca-Cola Bottling Co., Asheville, North Carolina

Like "the pause that refreshes" is this Coca-Cola lobby designed by Architect H. I. Gaines. Here are design and treatment that hold attention because of their refreshing liveliness and vigor. Offices as well as the lobby are finished in Figured and Plain Quartered Walnut Flexwood; 3,500 sq. ft. being used. The availability of rare and exotic woods in facile form, quickly and economically applied, affords architects and designers unlimited opportunities for including luxurious wood treatments in normal decorating budgets. Flexwood is a logical choice when genuine wood is called for in a modern treatment.

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Study

FOR A CALIFORNIA SUPER MARKET

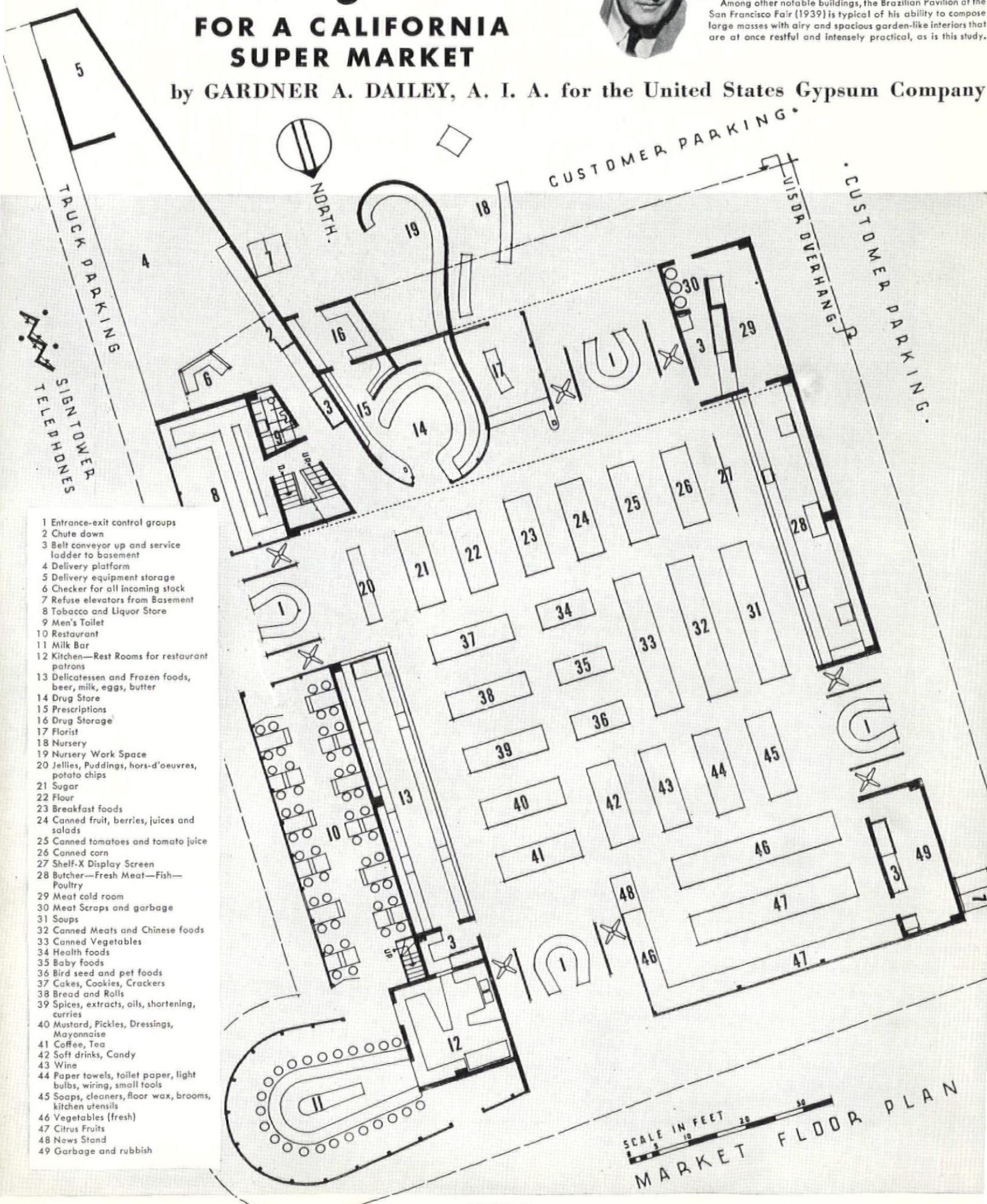
by GARDNER A. DAILEY, A. I. A. for the United States Gypsum Company

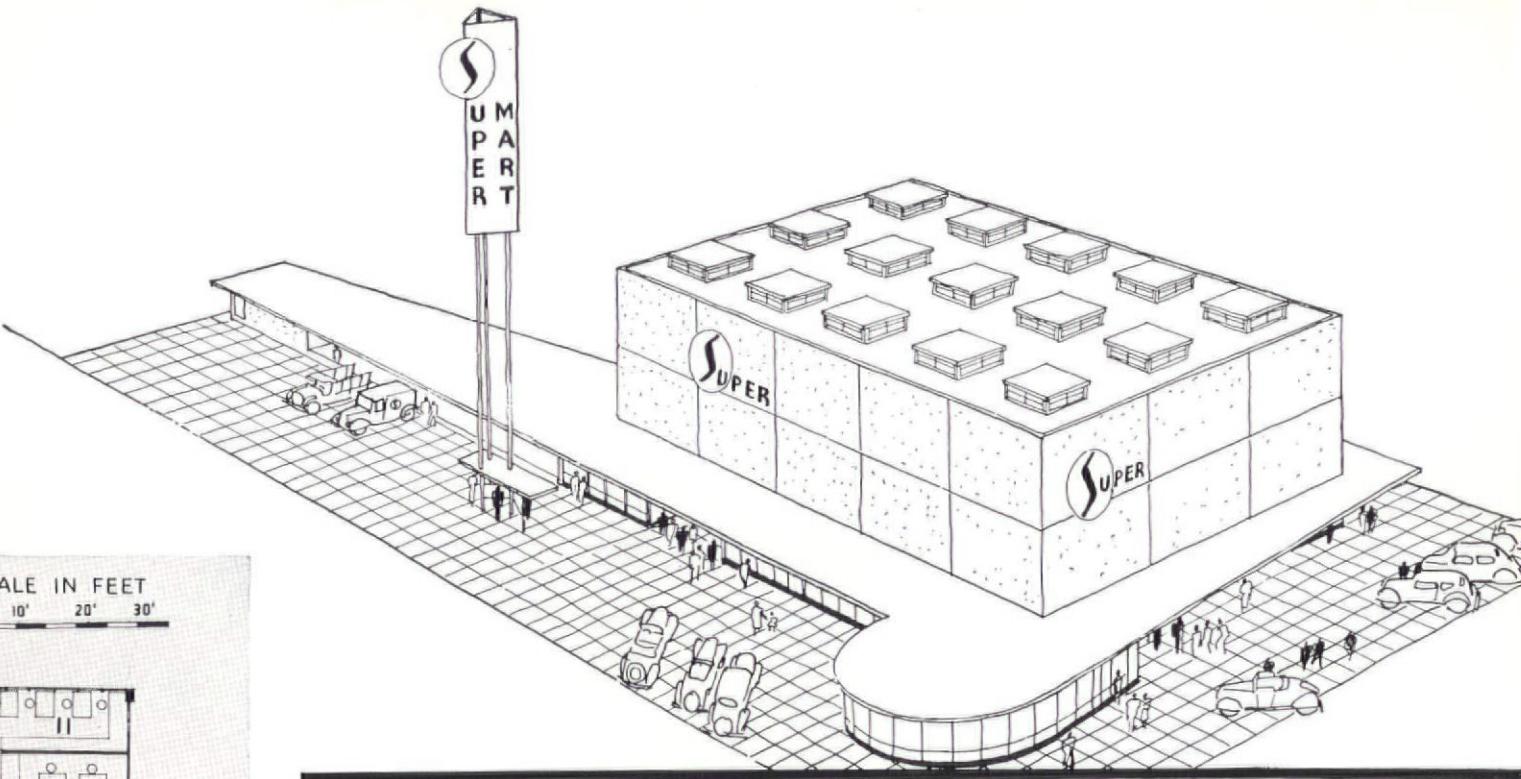


Gardner A. Dailey, A.I.A., wounded in World War I while commanding the first night flying squadron of the American Army, had already acquired considerable architectural experience constructing housing units for plantation workers in Central America.

After the war, a period of construction work in Mexico and study abroad preceded the establishment of his present general practice in San Francisco in 1928.

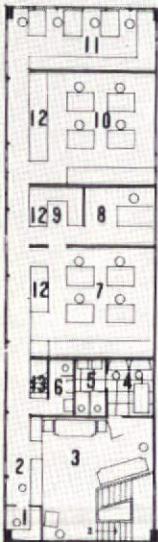
Among other notable buildings, the Brazilian Pavilion at the San Francisco Fair (1939) is typical of his ability to compose large masses with airy and spacious garden-like interiors that are at once restful and intensely practical, as is this study.





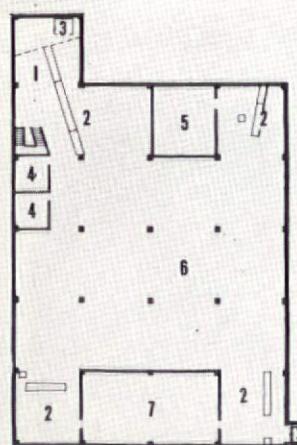
SCALE IN FEET

0' 5' 10' 20' 30'



• MEZZANINE FLOOR

- 1 Telephone Girl
- 2 Receptionist
- 3 Waiting
- 4 Ladies' Rest Room
- 5 Ladies' Toilet
- 6 Men's Toilet
- 7 Stenographers and Accountants
- 8 Manager
- 9 Secretary
- 10 Buyers
- 11 Printing and Sign and Display Making
- 12 File and Miscellaneous Storage
- 13 Up, to File and Display Storage



- 1 Chute from delivery
- 2 Conveyors to market floor
- 3 Refuse elevators up to sidewalk
- 4 Employees lockers
- 5 Meat cold room
- 6 General grocery storage
- 7 Air conditioned vegetable storage

The third study in this series of solutions to timely problems is presented here.

These USG presentations have two objectives. First—to encourage, promote and publicize original thinking, designing, and planning. Second—to illustrate and explain how new materials and construction methods, developed by laboratory and field research, contribute to better, safer building, and lower cost. Greater strength, added fire protection, more comfort, safety, broad decoration opportunities, plus faster application, are all possible with these materials and methods.

You will see more studies in future issues of the **FORUM**. Look for them—and please don't hesitate to comment or criticize any of them.

Today the super market is a *super* business calling for *super* management. The efficiency of planning and managing these stores is one of the most remarkable things about them. They are the present-day "Butcher and Baker and Candlestick Maker" rolled into one, then raised to the N-th power.

The great variety of things displayed under one roof outwardly suggests the "market place" of so many European and Latin-American cities and towns. But behind the scenes is one of the most complex and smoothly operating machines imaginable—a striking tribute to the ingenuity of American business. For instance, the typical corner grocery store may handle 2,000 individual items. But a super market may handle as many as 20,000 items—with no apparent effort and even less confusion than is apparent in smaller stores.

It wasn't so long ago that the neighborhood chain store was the marvel of its neighborhood. Now the chain store is outmoded. In its place we find the all-inclusive market. If the market is two years old, it may be of the non-competing concessionaire type. If it is more recent,

it will probably be under single ownership. The single ownership type has proved more satisfactory. The saving in overhead is shared by both buyer and seller and has made possible an increase in efficiency.

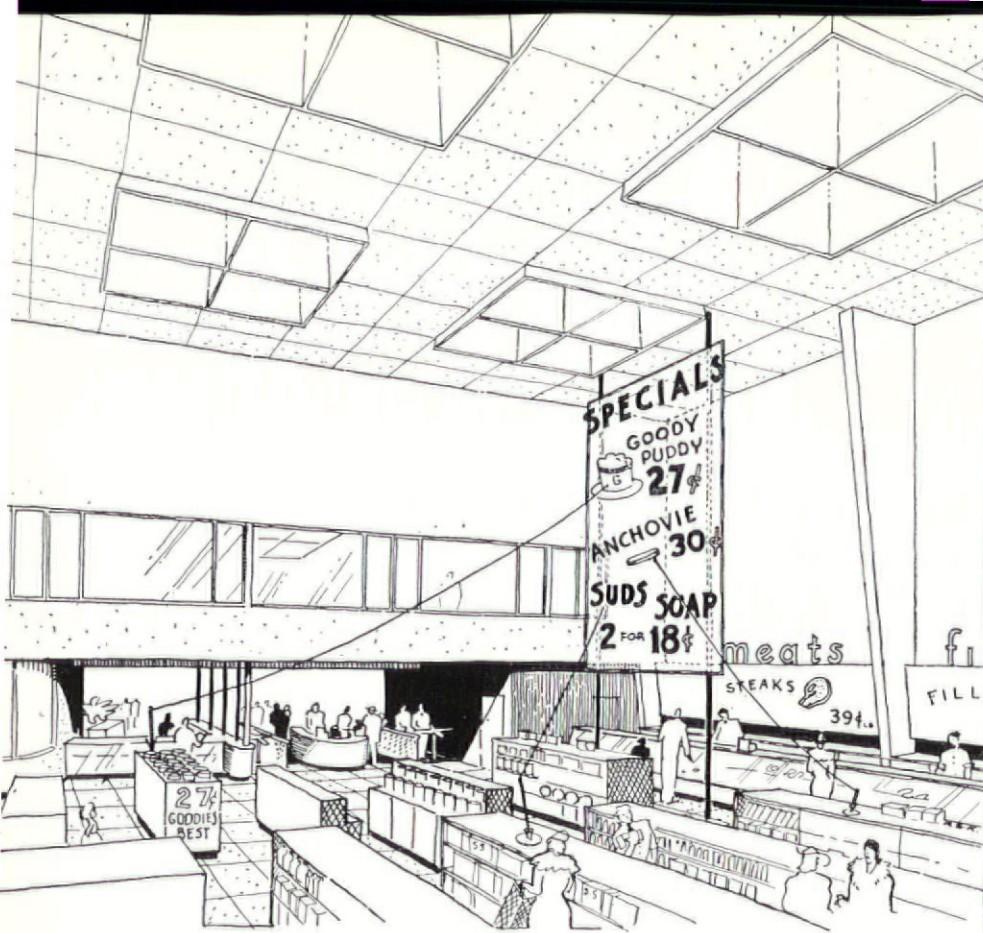
This project is the self-service, single ownership type of market

The most recent development of the food selling industry is the self-help controlled type, really a *Food Department Store* with a single centralized organization of purchasing, accounting and selling. In planning such a market, we have selected a hypothetical California location, designed the market for California weather.

This type of market is just as popular in the north, south, and east. Our basic solution, therefore, with such changes in design as might be necessary due to climate, could be located virtually anywhere.

The automobile has made the development of this Super Market possible. Ample parking, not only on the streets but in side lots, is a prime necessity. 75% of the business of these markets comes from automobile customers. So we locate

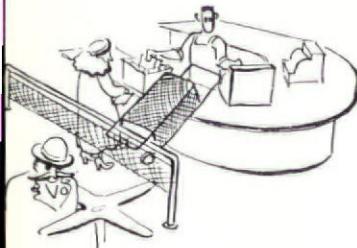




our market on a main thoroughfare, preferably a corner. It should be adjacent to a residential district or on the way to one. In some of the larger and newer subdivisions in California, markets have been completed and are in operation at important street or highway intersections even before the paving has been completed on the secondary streets. This would indicate the importance attached to adequate shopping facilities in *any* residential area.

Accessible from all sides, the super market is a shopping "island." In planning it, care must be taken to preserve a smooth traffic flow in all directions. Broad aisles, straight and direct, must take flow and cross-flow without confusion. Entries and exits must be convenient on all sides.

We must also design for flexibility. Certain parts of this business must remain open until late hours. The liquor store, restaurant, drug store, and delicatessen may even remain open all night. We locate these parts on the perimeter so as to be able to close off the market section by



Display is another necessity of our plan. It may be either entirely open or glazed. The passer-by must be enticed by an attractive display of colorful fruits and flowers, bright lights and activity. This openness is also desirable for ventilation. In warmer climates like California, the market would seldom be closed. Else-

where glazing would combine year 'round usefulness with display.

Appearance is a top-notch salesman anywhere. A vital part of the planning of a super market is to conceal the unpleasant activities that go on behind the scenes like storage, cleaning, handling, garbage, waste removal, etc. These are best placed in the basement. By using chutes and conveyors, these "backstage" operations can be kept conveniently close to the point of selling and display, and leaves the entire floor space of the building free from debris. The customer accepts this neatness as a matter of course, but he has little idea of the vast amount of work involved in checking and restocking, cleaning and arranging. Furthermore, he doesn't want to see any sign of it.

As soon as the food section of the market is closed, the night crew comes on. By means of a plug-in phone system, a checker at each section calls off to stock room clerks items to be replenished for the next day's business. These items are assembled and sent up on a belt conveyor. While this is being done, the checker moves on and plugs in his phone at the next counter. This work of checking and replenishment, cleaning, and refuse removal takes the greater part of the night.

A continuous flow of replenishment goods are needed in an establishment like this. Trucks bringing in stocks unload at the delivery platform. Merchandise is checked and chuted to the basement storerooms where each product, perishable or non-perishable, goes to its own section to await the time it is sent up the belt conveyors to its ultimate station.

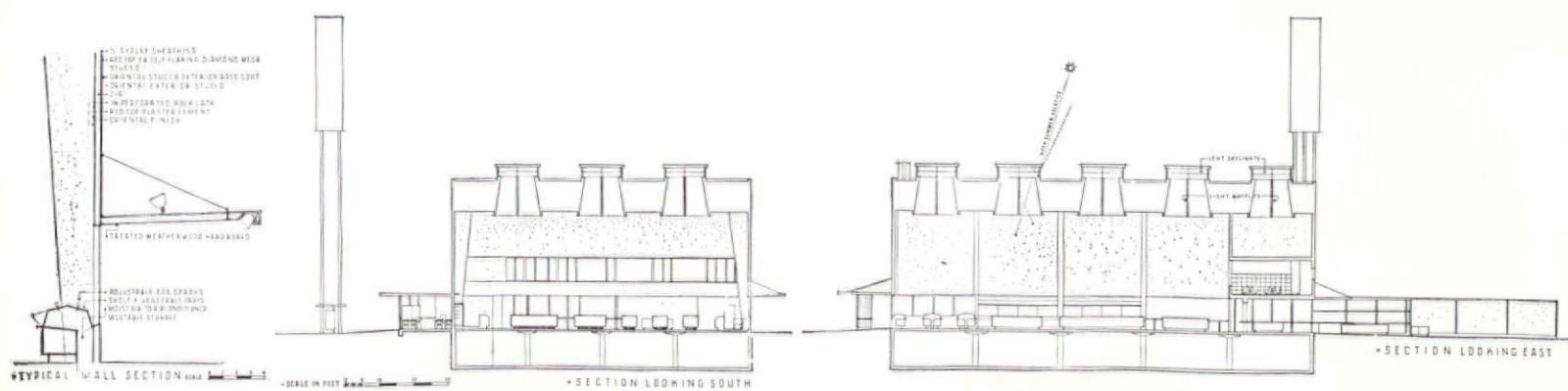
A Super Market Is a Commercial Structure

The modern super market must be built strongly, yet inexpensively. It must pay a reasonable return, but not have its income drained by constant maintenance. The materials selected for its construction must bear all the brunt of hard usage, dampness, cleaning and scrubbing, knocking and abuse but still protect the investor's dollar.

It was for this reason that the United States Gypsum Company approved my suggestion that this study be a super market—without question one of the toughest possible tests on the durability, strength, and economical uses of building materials. Certain USG materials meet these obligations most effectively, and also, they perform valuable display and service functions at very reasonable cost.

On the opposite page are my construction recommendations of USG materials which to the best of my knowledge and experience adequately meet all the requirements a project of this kind would of necessity establish.

GARDNER A. DAILEY



ADVERTISEMENT

CONSTRUCTION AND SPECIFICATION

Suggestions

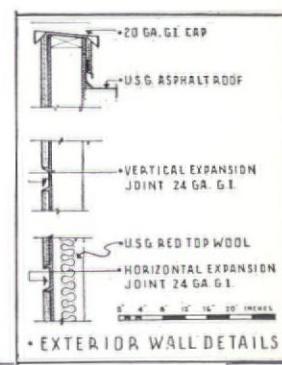
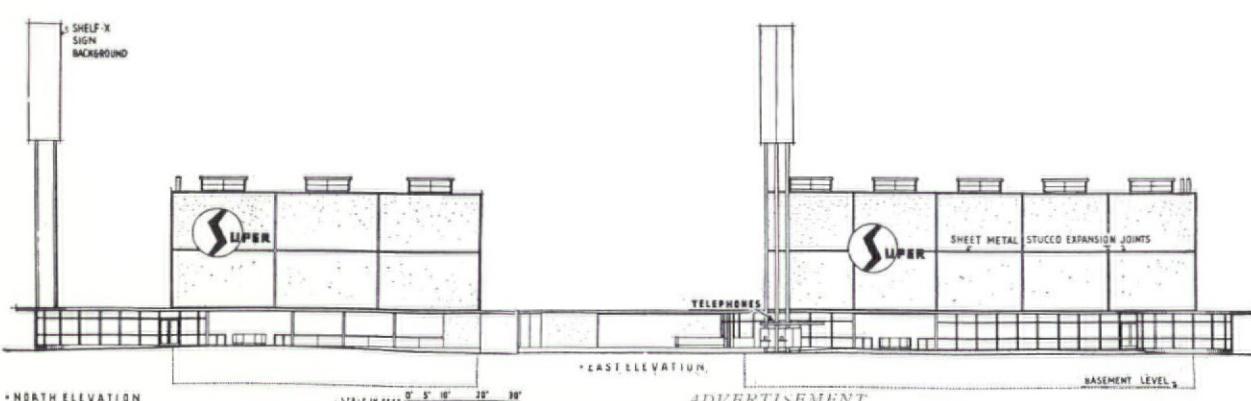
USG TYPE NO.	PAGE IN "SWEET'S" CATALOG FILE	
EXTERIOR WALL ASSEMBLIES		
EW-5	Outer Face—Wood Framing covered with $\frac{1}{2}$ " Gyplap Sheathing. Red Top 3.4 Self-Furring Diamond Mesh Lath covered with Oriental Exterior Stucco Base Coat and Oriental Exterior Stucco floated or textured finish. NOTE: It is to be noted when galvanized iron sheet metal spacers forming a recess are used on these exterior surfaces and at corners and angles, the spacers absorb shrinkage, guide the plasterer and likewise give the designer an opportunity to break up these large surfaces into interesting subdivisions.	Page 11—Catalog 9/17
IW-2	Inner Face—Wood Framing $\frac{3}{8}$ " Rocklath—Red Top Cement Plaster Oriental Interior floated or textured finish	Page 8—Catalog 9/17 Page 22—Catalog 9/17
IW-6	Alternate Constructions Red Top 3.0 Diamond Mesh Lath Red Top Cement Plaster USG Hydrated Finishing Lime—USG Gauging Plaster K-Cemo Primer Texolite "330." Kitchen Walls Enamel	Page 8—Catalog 9/17 Catalog 17/19
IW-11	$\frac{1}{2}$ " Recessed Edge Sheetrock Wallboard and Perf-A-Tape Joint Treatment K-Cemo Primer Texolite "330." Kitchen Walls Enamel CEILING ASSEMBLIES (In General)	Page 24—Catalog 9/17 Page 8—Catalog 17/19
C-3	$\frac{3}{8}$ " Perforated Rocklath—Bridjoint Clips Red Top Cement Plaster $\frac{3}{4}$ " Hi-lite Weatherwood Panel Tile	Page 12—Catalog 9/17 Page 20—Catalog 9/17 Page 2—Catalog 11/44
C-6	Alternate Construction Red Top 3.4 Diamond Mesh Lath Red Top Cement Plaster USG Hydrated Finishing Lime—USG Gauging Plaster K-Cemo Primer Texolite	Page 6—Catalog 9/17 Catalog 17/19

USG TYPE NO.	PAGE IN "SWEET'S" CATALOG FILE
CEILING ASSEMBLIES (In Particular)	
	In the business offices on the mezzanine floor all ceilings are to be 15/16" Acoustone "D" tile set flush with the ceiling for sound absorption. In the Restaurant and Milk Bar 15/16" Acoustone "D" with Perfatone on the Kitchen ceilings. Enamel on walls.
	PARTITION ASSEMBLIES
P-4	Wood Studs $\frac{3}{8}$ " Rocklath with Bridjoint clips on both walls and ceilings. Red Top Cement Plaster Oriental Interior floated or textured finish Alternate Construction Red Top 3.0 Diamond Mesh Lath Red Top Cement Plaster
P-9	USG Hydrated Finishing Lime—USG Gauging Plaster K-Cemo Primer Texolite "330" $\frac{1}{2}$ " Recessed Edge Sheetrock and Perf-A-Tape Joint Treatment K-Cemo Primer Texolite "330"
	ROOF COVERING USG Built-Up Asphalt Roofing
	INSULATION All Exterior Walls and Ceilings immediately under roofs Red Top Thick Insulating Wool
	TRAYS, RACKS AND MISC. ACCESSORIES
	Throughout this building U S G Shelf-X is used in many ways. It is used for trays in vegetable and other counters, grilles at turnstiles, push carts and on large display screens. The upper part of the tower outside the entrance is covered with it as it is strong and offers little wind resistance, although being a good background for signs.
	MISCELLANEOUS
	A—The business offices on the Mezzanine may have wood grained Sheetrock in mahogany pattern and the liquor store a similar material in one of the other woods. The Drug Store and Florist may have wood grained Sheetrock in still other patterns.
	B—Counter tops throughout where wear resistance is important will be covered with Treated Weatherwood Hardboard. This same material will be used underneath all visors around the building.
	C—Counter fronts, wainscots in Restaurant, Kitchen, Toilet Rooms and surfaces exposed to wear will be covered flush with Weatherwood Hardboard and enameled to a high gloss durable enamel.
	D—Light baffles in skylight wells shall be of large sheets of Weatherwood Hardboard panels.
	Pages 4 and 5—Catalog 11/44
	Page 6—Catalog 11/44
	Page 6—Catalog 11/44
	Page 6—Catalog 11/44

U.S. UNITED STATES GYPSUM COMPANY

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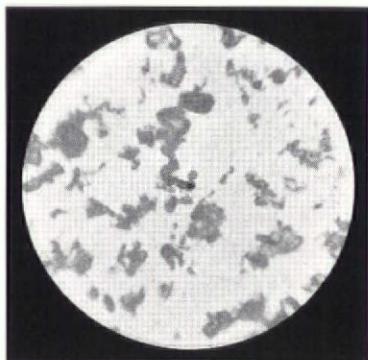
SPECIFICATION AND BUYING INDEX

The advertising pages of THE ARCHITECTURAL FORUM have become the recognized market place for architects and all others engaged in building. Each month these pages offer the most complete guide to materials, equipment and services to be found in any magazine. A house or any other building could be built completely of products advertised in THE FORUM. While it is not possible for a magazine to certify building products, it is possible to open its pages only to those manufacturers whose reputation merits confidence. This THE FORUM does.

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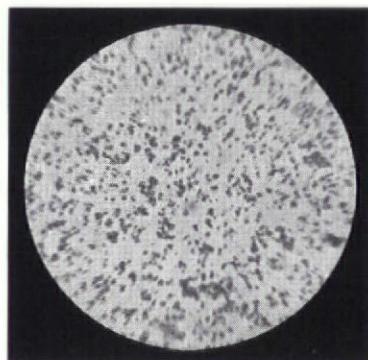
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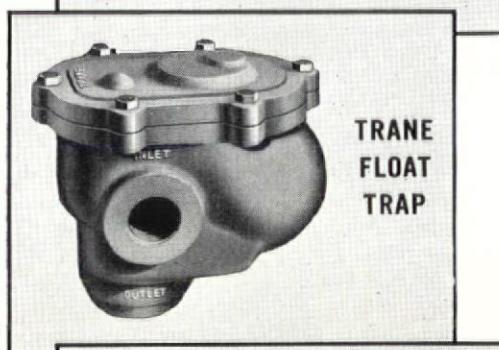
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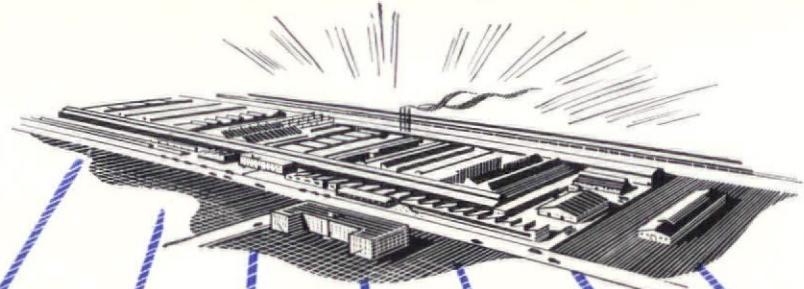
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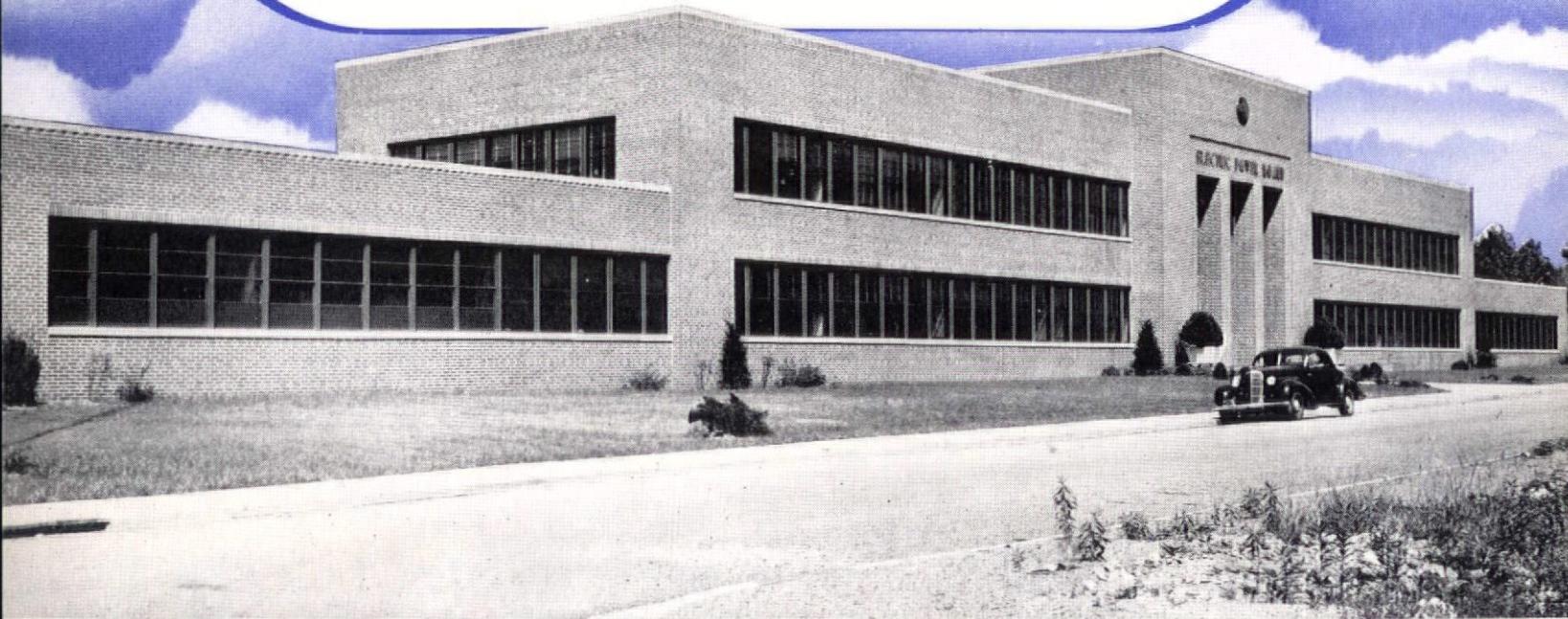
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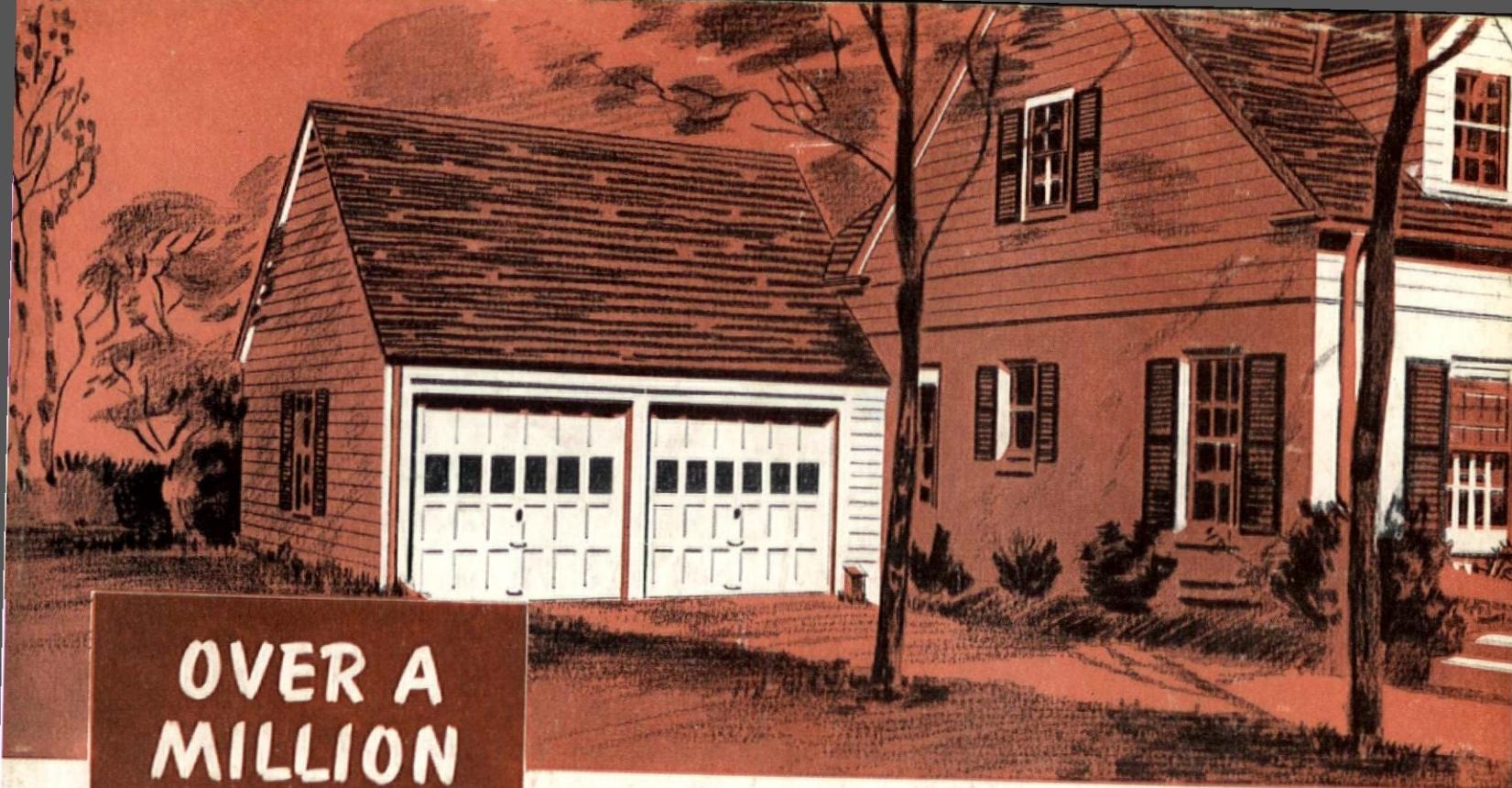
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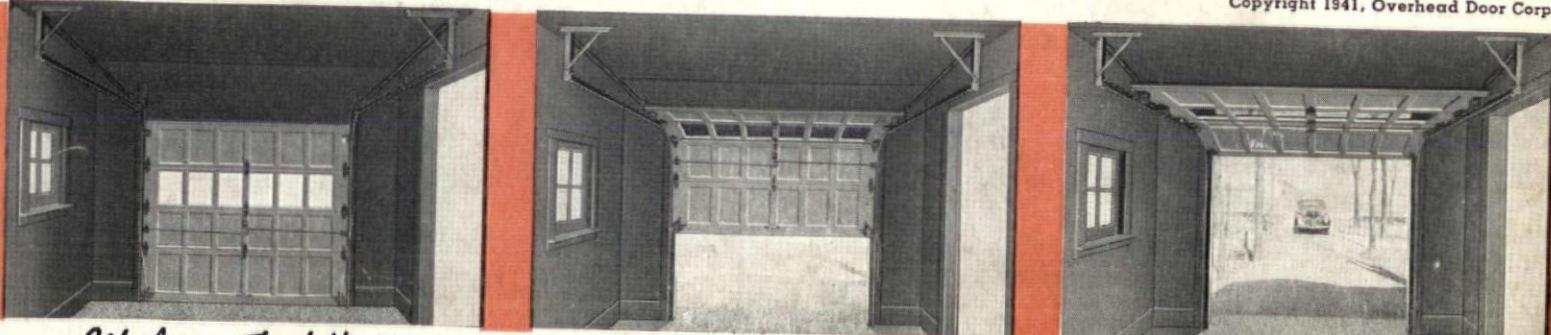
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